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# THE IRON AGE

**A Review of the Hardware, Iron, Machinery and Metal Trades.**

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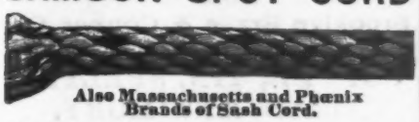

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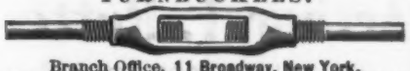

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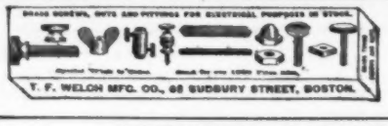


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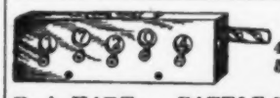
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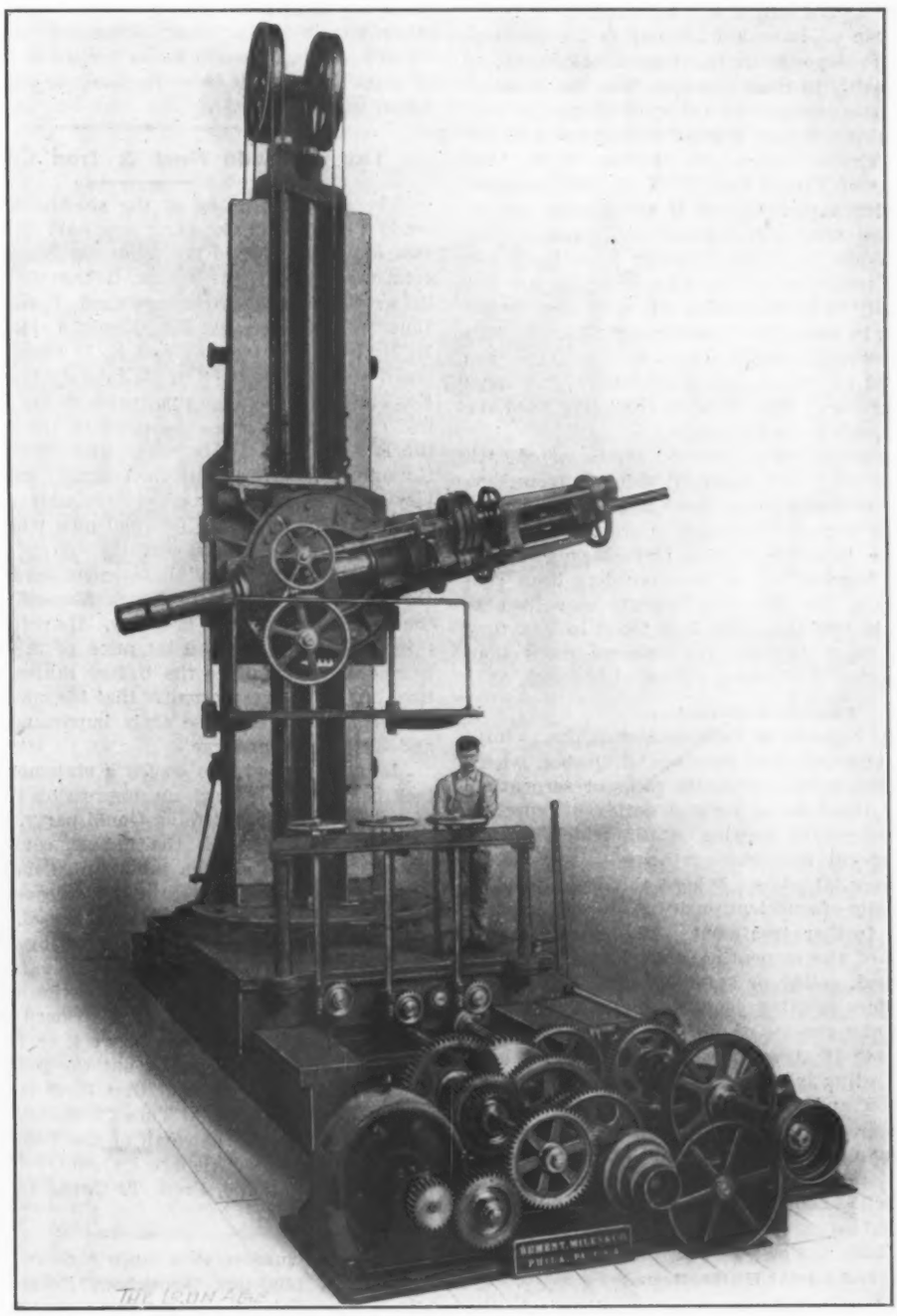
# THE IRON AGE

THURSDAY, AUGUST 27, 1903.

## Universal Horizontal Boring, Drilling and Milling Machine.

The Niles-Bement-Pond Company of New York have built for the Carnegie Steel Company a universal horizontal boring, drilling and milling machine intended for the heaviest class of work, such as armor plate. The column is supported on a massive bed, on which it has a traverse of 10 feet by power. It supports a counterweighted saddle with 10 feet vertical traverse by power. The column rotates on its axis through an arc of 90 degrees on its base, which also serves as a platform for the operator, and from which position all movements of the machine are controlled through convenient levers and hand wheels. The spindle is of steel, 8 inches in diameter, and has 4 feet traverse, and six changes of power feed, suitable to requirements of boring and drilling; it also has rapid hand adjustment. It swivels on the saddle to an angle of 45 degrees above or below the horizontal position through worm, worm wheel and circular steel rack. Besides the boring and drilling feeds, there are eight independent automatic milling feeds vertically and horizontally in either direction. The column and saddle traverse may be altered to suit requirements, and a work table of any desired size furnished, also outboard post with bearing for outer end of boring bar. The machine is driven by two Westinghouse motors. A 20 horsepower, making from 570 to 850 revolutions per minute, drives the spindle, and a 10-horse-power, making 1250 revolutions per minute, controls the milling feeds and the rapid traverses of the column and saddle.



UNIVERSAL HORIZONTAL BORING, DRILLING AND MILLING MACHINE.

## Production of Chromic Iron Ore in 1902.

WASHINGTON, D. C., August 25, 1903.—The annual report of the United States Geological Survey on the production of chromic iron ore in 1902, which has been prepared by J. H. Pratt, shows an output of 315 short tons, valued at $4567, which is a decrease of 53 tons in quantity and $1223 in value as compared with the production in 1901, which was 368 short tons, valued at $5790. California was the only State to produce any chromic ore in 1902. The domestic output has shown very remarkable fluctuations during the past ten years. In 1893 the product was 450 long tons and in 1894 it rose to 3680 tons, the high water mark of the industry. In 1895 the output was reduced to 1740 tons and in 1896 to 786 tons. No production was reported thereafter until 1900, when the recorded output was 140 tons.

There has been no increased activity in the development of chromite deposits in the United States during the past year, owing to their distance from the point of consumption. This obstacle is being overcome by better railroad transportation. With the completion of the railroad from Erwin, Tenn., to Marion, N. C., the chromite deposits of Yancey County, N. C., will undoubtedly be thoroughly exploited, and if the present indications are fulfilled they will become producers of this mineral. There has been some change recently in the manufacture or treatment of chromite ores that are not of sufficient purity to be shipped as mined or that cannot by hand cobbing be brought to contain a sufficiently high percentage of chromic acid. Ores of this type are crushed, stamped or rolled, and then passed over some form of concentrators. Stamp mills are being used for this purpose, especially in Canada.

There is a large amount of chromite ore imported each year into the United States, most of which is from Turkey, with small amounts from New Caledonia and Canada. Up to 1884 little or no chromite ore was imported and there was a large production from Maryland, but since then the importation of this ore has been constantly increasing. In 1890 the imports amounted to 4353 long tons; in 1895 they were 5230 tons; in 1900 they rose to 17,542 tons; in 1902 the imports more than doubled, aggregating 39,570 tons, valued at $582,597.

### Canadian Deposits.

The principal deposits of Canada are in the vicinity of Black Lake and Colraine, Province of Quebec, where the mineral occurs in the peridotite rocks or serpentine. In this district these rocks form a series of approximately parallel belts of varying width, which can be traced in a general northeast-southwest direction for a distance of over 20 miles. Where the ore occurs in masses it is usually of sufficient purity to ship directly, as mined, without further treatment. Where it is an intimate mixture of the serpentine and chromite the ore has to be crushed, rolled or stamped, and then passed over Whifley tables or other concentrators. The method now being used at a number of mines is first to crush the ore, then to pass it through a stamp mill and over Whifley concentrating tables. The concentrates are then dried and bagged, and are ready for shipment. During 1902 mining was carried on at the Whitney and Colraine mines and at the mine of the Montreal Chrome Company. The production amounted to 900 long tons, valued at $13,000. This will undoubtedly be increased in 1903, as the Colraine mines are being extensively and systematically worked.

### Industrial Utilization.

The principal use of chromium as an alloy is in the manufacture of ferro alloy, and this has become a very important industry. The ferrochromium is used in the manufacture of chrome steel, which finds its greatest use in armor plate and armor plate piercing projectiles. The armor plates are usually made by the addition of the alloys ferrochromium and ferronickel to the molten steel before it is cast into the ingot, and they produce a more or less homogeneous triple alloy. Chromium in the presence of carbon makes steel intensely hard. At the same time it gives steel a high power of resistance to shock, which adapts it especially to use for armor plate, and also to any severe service, and to resistance to abrasion, as in trolley car wheels, crusher jaws, stamp mill shoes, &c. A chrome steel has long been made for use in the manufacture of safes. In the manufacture of a ferrochromium alloy it is necessary to use a high grade chromium ore low in silica, which, on account of its refractory character, can be reduced only by the employment of electric heat.

Chromite as a mineral is largely used in the manufacture of bricks for basic open hearth furnaces. These bricks have been used as linings for a number of furnaces, and at one furnace over 400 heats were turned out before the lining had to be replaced. Although the price of these chrome bricks is considerably higher than that of silica bricks, yet on account of their lasting so much longer they are much more desirable. Their use in the back walls of gas ports has decreased and a magnesia brick has, as a rule, been substituted for them. Another use that is being advocated for the mineral chromite is as a hearth lining for water jacket furnaces in copper smelting, and this use has already begun to a limited extent. W. L. C.

## The Colorado Fuel & Iron Company.

The annual meeting of the stockholders of the Colorado Fuel & Iron Company was held in Denver on August 19. They elected the following Board of Directors: John C. Osgood, J. A. Kebler, George J. Gould, John D. Rockefeller, Jr., F. J. Hearne, Fred. T. Gates, E. H. Harriman, Edwin Hawley, Ben Nicoll, J. H. McClemont, J. H. Hyde, E. W. Oglebay and E. P. Prentice. It is conceded that the re-election of John C. Osgood and J. A. Kebler to the board does not presage any immediate radical changes in the management of the company, while the fact that E. H. Harriman and Edwin Hawley continue to be identified with the company indicates that the new controlling interests have probably reached a clear understanding with the railroad men who hold stock as to the future of the company.

According to an official statement made by him, John D. Rockefeller, Jr., is to devote himself particularly to the development of this property. He refused to say anything about the reported intention of the new managers to sell the company to the United States Steel Corporation, but made every promise that his management of the property would increase their importance to the State and the country at large.

John C. Osgood also issued a statement, in which he took occasion to correct the impression that he was antagonistic to the Rockefeller-Gould party, which, he said, had treated him with the utmost consideration. He added that there was no intention of making wholesale changes among the officers and employees, and that all who were competent would be retained. Mr. Osgood's hold upon the situation is explained by his large interest in subsidiary and associated companies, in some of which he holds a controlling proportion of the stock.

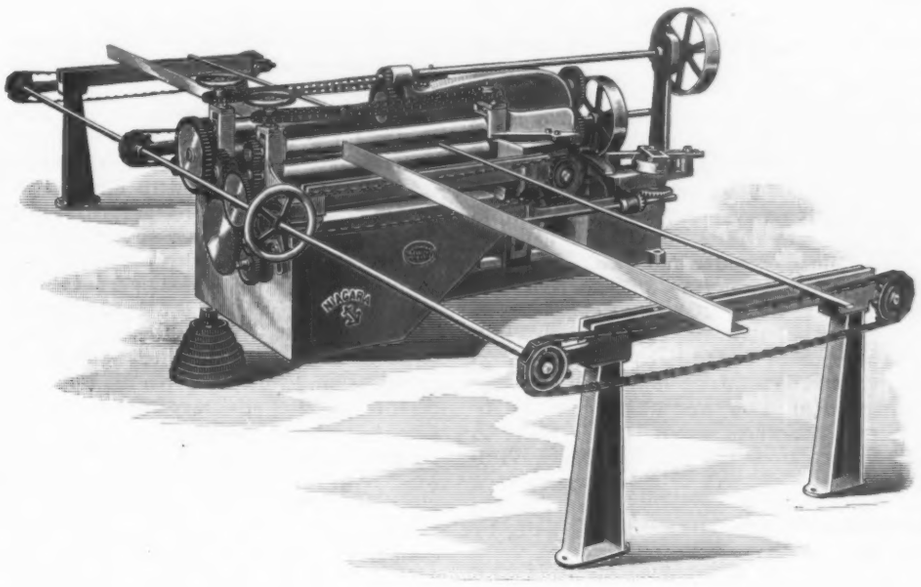
When the organization of the Board of Directors is completed, which will be in a week or two, the subject of a financial plan to carry out the improvements will be taken up. It is thought that F. J. Hearne, formerly president of the National Tube Company, may be elected both president and chairman of the Board of Directors, with John C. Osgood, George J. Gould, F. J. Hearne, J. D. Rockefeller, Jr., and Fred. T. Gates as the Executive Committee.

The labor unrest in France continues in some districts. The tendency throughout France is toward a higher rate of pay generally, for some statistics recently issued show that wages have doubled within the last 50 years. The workers also live on a higher scale, the food being better than formerly. The conflicts in Spain are partially industrial and partly political, but much of the incitement to disorder comes from the opposing sections in political life. In Russia the strike movement is said to be extending. In Odessa alone it is said that 25,000 workers are on strike. The complaints are as to long hours, low wages and impossible conditions of employment. The men are also liable to be discharged on the slightest pretense, and the fines imposed are said to be intolerable.

## The Niagara Automatic Elbow Curve Shears.

The Niagara Machine & Tool Works of Buffalo, N. Y., have designed an automatic machine for cutting the curved sections for round elbows without using any templets. It is suitable for elbows of any diameter, and adjustable for elbows of any angle, and composed of any desired number of pieces, not less than four, provided the rise of the curve does not exceed 10 inches, as limited by the depth of the throat in the cutting head, and provided the original width of the sheet is 36 inches or less. It is immaterial whether the seam of the elbow is in the throat or on the side.

The machine consists of a set of four feed rolls and a movable head with rotary cutters. The sheet is put in position by the oparator on one side of the feed roll between suitable gauges, and when the feed rolls take hold of it they carry it through the machine on a straight line. The gauges are made in two sections, with parallel adjustment to the proper position from the cutters by means of hand wheel and sprocket chains. The head which carries the rotary cutters has two distinct movements. It moves forward and back as required by the rise of the curve of an elbow section, and at the same time its rear part swings in such manner that the cutters will always be in tangential position to the curved line, which is necessary for smooth and accurate cutting. These movements are carried out theoretically correct, and a cycle of them is timed according to the length of the elbow section which is being cut by connecting the feed rolls with the mechanism of the cutting head. Adjustment for the curves of various elbow sections is made on the cutting head by means of crank movements, regulating the in and outward and swinging motion, and by means of change gears giving the length of an elbow section. The cutters are so arranged that they will cut the convex as well as the concave part of the curves freely.




THE NIAGARA AUTOMATIC ELBOW CURVE SHEARS.

Means are provided for gauging the sheets for the successive cuts. Eighteen change gears are provided, which take care of elbows from 8 to 80 diameter, varying by 2 inches. Four-piece elbows can be cut up to 38 inches, six-piece up to 62 inches and eight-piece up to 80 inches diameter. On still larger elbows the number of pieces must be increased to limit the hight of the curve to 10 inches.

---

The National Enameling & Stamping Company have purchased the entire capital stock issued of the Whittaker & Weber Mfg. Company of St. Louis, Mo., and the control and ownership of the plant heretofore operated by them, consisting of realty, machinery, tools, dies, patterns, patent rights, trade-marks and good will. Payment was made in stock of the purchasing company—namely, $150,000 in preferred and $150,000 in common stock.

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## The "One-Break" Working Day.

In an article under the caption of "Americanizing Edinburgh's Industries," the Edinburgh *Dispatch* of July 18 says that in many British engineering shops and other establishments American systems and methods of employment and pay have been adopted during the past two or three years. A description is given of the premium or bonus system, but most space is devoted to what is called the "one-break" day. This means stopping for the noonday meal only. It has long been the custom for British workmen to start work at 6 o'clock in the morning and stop for an hour at 8 o'clock to take breakfast. Following is a portion of the remarks by the *Dispatch* on this subject:

The "one-break" system is another American idea which has gained a footing in this country and is rapidly growing in favor. By this arrangement the breakfast hour is done away with, and the men start work at 7 or 8 o'clock in the morning, having had a good meal; there being only one break during the rest of the day for dinner. It is contended that this is a much better method, both for men and masters. The men do not start hungry, and being therefore fresher and better rested they are able to pay more attention, and consequently turn out more and better work. Then, again, the waste, inconvenience and delay caused by stopping and restarting at breakfast time, the annoyance of men coming in late and the other evils of the two-break system are done away with; the output is increased and the men are healthier and more physically fit to undertake the duties of the day. The one-break system was first introduced into Great Britain by a Leeds firm in April, 1901, and was quickly imitated by another firm in the same town. The workmen at first raised an objection, on the ground that the day was too long to work with only one break, and asked either for a reduction of hours or a withdrawal of the system. The matter was subsequently discussed at a central conference of the Engineering Employers' Federation, where it was stated that 83 firms throughout the country, of which 26 were federated firms, had adopted the system, and were on an average working a 51-hour week. The experience of these firms, it was stated, was that the workmen, after they became accustomed to them, preferred the altered hours. In 13 firms the hours were divided as follows: Monday, 8 a.m. to 6 p.m., with the dinner hour from 12 to 1 o'clock; Tuesday, Wednesday, Thursday and Friday, 7 a.m. to 6 p.m., with the dinner hour at the same time; Saturday, 7 a.m. till noon—a total of 54 hours.

# Laboratory Notes.

BY ERIC JOHN ERICSON, CHICAGO, ILL.

### A New Sulphur Method for Iron and Steel.

The suggested method is an application and modification of Carius' method for sulphur in organic compounds to the gravimetric determination of sulphur in pig iron and steel. Perhaps no other element has given the iron and steel chemist so much trouble as sulphur, particularly in pig iron. It is well known that the evolution method does not always yield all the sulphur, and even the usual gravimetric methods leave much to be desired with regard to concordant results and are at the best somewhat low, owing to incomplete oxidation. This method insures perfect oxidation, requires less attention while dissolving and gives uniform results. A number of standards from different firms were tried and all gave slightly higher results.

The method is as follows: Introduce 3 grams of borings or drillings into a glass tube of hard Bohemian glass, 3 feet long, with ¾ inch inside diameter and a thickness of glass of 3-32 inch. Add 25 to 30 c. cm. strong nitric acid, 1.42 specific gravity, and 5 c. cm. strong hydrochloric acid, 1.20, heat and draw the open end out to a capillary and seal. Cool and put into a water bath, heat to boiling for one and a half to two hours; cool the bath, preferably over night, break the capillary, add 5 to 10 c. cm. of dilute hydrochloric acid and boil for five minutes. Transfer to a porcelain casserole, add 0.2 gram sodium carbonate, evaporate nearly to dryness, then add 20 c. cm. strong hydrochloric acid and evaporate to dryness two to three times. Redissolve in strong hydrochloric acid, dilute with an equal volume of water, filter and wash with lukewarm water. The filtrate, in a No. 3 Griffin beaker or 16-ounce conical flask, is made slightly ammoniacal, 10 c. cm. barium chloride is added and then slightly acidified with hydrochloric acid and diluted with water to about 300 c. cm. volume. Boil down to about 100 c. cm., allow to stand over night, filter, and wash the resulting barium sulphate with lukewarm water. Run a blank on chemicals and subtract from the obtained barium sulphate. This *modus operandi* will in most cases give a precipitate free from iron. Precipitating in an alkaline solution as recommended by Dr. Hillebrand* is better by far than the old way.

Particular care should be taken to avoid explosions. It is best to have the capillary end of the tube (top) facing the wall and in front of the bath an asbestos sheet. Choose a suitable corner for the bath away from the general working table. Wear glasses or goggles while sealing and breaking the capillary. When the tube has been used for a number of determinations and shortened to about 20 inches it can be used for smaller samples, say 2 grams.

This method is especially recommended for making sulphur standards and check work in general.

### Method of Analysis for Fluor Spar.

Those who have had occasion to analyze fluor spar and endeavored to look up particulars must have been astonished at the almost total lack of any. Decomposition by means of fusion with sodium carbonate is not always complete and gives too low calcium, partly because the carbonate of calcium is not completely insoluble in water, if a separation from sodium fluoride and alumina be attempted by this means. Furthermore, some calcium is coprecipitated along with iron and alumina, owing to the presence of fluorine. The writer has had occasion to analyze a great number of samples, and has worked out and adopted the following method:

Decompose 0.5 gram in a large platinum crucible with enough concentrated sulphuric acid to thoroughly saturate the sample. Evaporate the excess of acid until white fumes cease to come off; then add 5 grams of sodium carbonate and fuse for 20 to 30 minutes. Cool, transfer the crucible to a 5-inch porcelain evaporating dish, add 60 c. cm. dilute hydrochloric acid, 1.10 specific gravity; evaporate to dryness twice to render silica insoluble, cool, add 75 c. cm. hydrochloric acid of the same strength, boil, filter, and wash twice with acid and five times with hot water. Burn off the filter paper in a tared platinum crucible and weight the silica. Repeated analyses have shown that the silica is not volatilized according to the following equation:

$$2CaF_2 + 2H_2SO_4 + SiO_4 = SiF_4 + 2CaSO_4 + 2H_2O,$$

as formerly supposed, but remains as shown by the following results:

| | Old method. | New method. |
|---|---|---|
| Fluor spar, December 10, 1902..... | 22.75 | 23.26 % $SiO_2$ |
| Fluor spar, December 15, 1902..... | 4.11 | 4.42 |
| Gravel spar, December 13, 1902..... | 3.96 | 4.08 |
| Gravel spar, December 19, 1902..... | 5.58 | 5.44 |
| Gravel spar, December 22, 1902..... | 4.08 | 4.14 |

It is not denied that the above equation holds good when mixed together. Silica and flour spar are heated with concentrated sulphuric acid, but when flour spar alone is treated as directed above, the silica in the spar itself remains as substantiated by the analyses submitted.

The following results were obtained on one sample: 5.20, 5.14 and 5.32, which is exceptionally good, considering the mineral.

Prior to this discovery the writer had thought that the hydrofluoric acid formed would attack and volatilize the silica present; hence a separate determination had been made by adding hydrofluoric acid and volatilizing.

In the filtrate from silica, iron oxide and alumina are precipitated by ammonia, lime by ammonium oxalate as usual, the calcium oxalate filtered after standing one and one-half to two hours, washed with hot water and calcined, or transferred with filter back into the same beaker in which it was precipitated, then 100 to 150 c. cm. water and 5 to 10 c. cm. strong sulphuric acid added, warmed and titrated with standard potassium permanganate. Iron value divided by 2 equals lime, or, more accurately, 558.8 parts iron equal 280.6 parts lime. If a qualitative test reveals the presence of carbonic acid, determine the amount of evolution and absorption in soda lime or potassium hydrate. From the total lime obtained subtract the amount necessary for combination with carbonic acid as calcium carbonate; convert the balance into fluoride by the factor 1.3937 or log. 14417. The above scheme of preliminary treatment simplifies the analysis considerably and gives excellent results.

Since writing the above the writer has found a statement in the periodical referred to that Jannasch (?) and another chemist have made observation that, in the presence of boron, boron fluoride is evolved without any loss of silica. A sample of gravel spar was subsequently examined for boron, but none was found, so in these cases the fact that the silica in the spar remains cannot be due to the presence of boron. Some of the samples contained zinc and a little sulphur, while the others were good commercial samples running over 91 per cent. calcium fluoride, the balance being silica, iron oxide and alumina.

A few words about the old method for silica may not be amiss. Treat 1 gram with 50 c. cm. cold dilute hydrochloric acid, 1 to 10 parts water, to liberate carbonates, if present, wash with cold water, transfer the residue to a platinum crucible and burn off the paper, taking care not to heat longer than is necessary for just burning off the paper. Cool and weigh the crucible plus the residue. Add hydrofluoric acid alone (without the addition of sulphuric) and evaporate on a hot plate, and finally bring to a low red heat for a few seconds with a Bunsen burner. Cool and weigh; the loss equals the silica.

### A New Method for Determination of Titanium.

This method is based on a statement in Prescott and Johnson's work on "Qualitative Analysis" that "Sodium phosphate precipitates the titanium almost completely, even in the presence of strong hydrochloric acid." Substituting ammonium phosphate as a precipitant in order to facilitate the washing and precipitating while boiling in an about 10 per cent. solution of hydrochloric acid, the titanium is completely thrown down as a white flocculent, somewhat gelatinous precipitate, insoluble in an excess of the precipitant; while aluminum, iron, manganese, &c., remain in solution. Only zirconium and tin interfere. Here we have at once an easy and rapid method; a determination can be done in about two hours.

* "Modern Methods of Mineral Analysis," by Dr. Hillebrand. February number *Journal of the Franklin Institute.*

The method is as follows: Dissolve from 0.3 to 0.5 gram of ferro titanium in 15 c. cm. dilute nitro-sulphuric acid (equal parts nitric acid 1.20 and sulphuric acid, one to three parts water) in a No. 2 Griffin beaker, evaporate to dryness or until fumes of sulphur trioxide come off, cool and add 15 c. cm. hydrochloric acid 1.10 specific gravity; boil, filter and wash once with acid and about five times with warm water. To the filtrate in a No. 3 Griffin beaker add enough sulphurous acid (or ammonium bisulphite) to deoxidize the iron, and then, while boiling, 25 c. cm. of a 10 per cent. solution of ammonium phosphate, and continue boiling for 20 to 30 minutes; allow to settle for nearly an hour, filter and wash with hot water. The precipitate has a tendency to go through the filter, but if pulp is used a little suction may be applied if desired. Dry and ignite the filter with the precipitate in a tared platinum crucible at a high temperature. Cool in desiccator and weigh. The titanium factor is 0.336.

Opinions seem to be divided as to the composition of the salt. According to Roscoe and Schorlemmer it is the basic titanium phosphate the formula of which is $Ti_2P_2O_9$. The writer has been unable to verify this, as analysis shows more titanium and phosphorus than the above formula represents. Using the factor suggested above—viz., 0.336, corresponding to $Ti_2P_2O_6$—gives results agreeing closely with those obtained by the old methods, as follows:

| | Precipitated by Sodium hyposulphite. | Precipitated by Ammonium phosphate. |
|---|---|---|
| Ferro-titanium | 8.65 | 8.70 |
| Ferro-titanium | 15.48 | 15.35 |
| | By ammonia. | Ammonium phosphate. |
| 100 c. cm. standard Ti sol. = 0.03528 | = 0.0350 | 0.0354 |
| 100 c. cm. standard Ti sol. = 0.02800 | = 0.0283 | 0.0280 |
| | 0.0264 | 0.0261 |

Ores may be fused with a mixture of potassium and sodium carbonate, transferred to a porcelain casserole and boiled with water. Allow to cool before filtering, as the titanates are not completely insoluble in water, especially in hot; filter and wash with water. Transfer filter with precipitate back to casserole, add 30 to 40 c. cm. hydrochloric acid 1.10 specific gravity, boil, filter and wash with hot water into a 500 c. cm. flask and dilute to mark. Pipette off a definite amount, evaporate to dryness, redissolve in 10 c. cm. strong hydrochloric acid and proceed as directed above. Should a very heavy precipitate be thrown down, it is necessary to pipette off a smaller sample, and conversely a larger.

## To Manufacture Radium.

A company has been formed in Buffalo to extract the rare metal radium, which to-day is the astonishment of the scientific world, from uranium ores obtained from Utah beds owned by the company. The Buffalo company proposes to make it a marketable commodity, producing it as a commercial article. A few years ago Stephen T. Lockwood of Buffalo, while in the West met two prospectors, who in searching for gold and silver had met peculiar ore deposits in Grand County, Utah. They sent the ore to an assayer, who reported not a trace of the precious metals. There was much uranium, however, and Mr. Lockwood knowing its commercial value urged the importance of the discovery upon the prospectors, with whom he had become associated, and claims were staked out upon the whole deposit. The Utah bed was carnotite, a combination of uranium, vanadium, iron, copper and barium, and, as later researches showed, radium and polonium. After establishing title to the claim Mr. Lockwood had returned East and subsequently became interested in the discovery of Professor and Madame Curie and Professor Becquerel's announcement of the radio-activity or uranium, followed as it was by the discovery of radium. This suggested to Mr. Lockwood that the uranium from Utah would yield radium as well as the uranium extracted from the flinty pitchblende. The carnotite from Utah was much easier to work than the pitchblende.

Mr. Lockwood, with the aid of George Banta, a young mining engineer, also of Buffalo, began the search. Carnotite was treated in 100-pound lots. The ore was crushed into fine sand and washed repeatedly with acids. The iron, copper and other known minerals were precipitated and the gangue sands eliminated, and finally out of the first lot of ore a small bottle of white powder, a compound of barium, was left. The barium compound grew more and more powerful. Then they enlisted the attention of the scientists in the Eastern universities, and at last a sample of radium-barium compound was produced which showed a potentiality of 365 on the delicate electroscope in Columbia University.

A testing plant will soon be built at or near Buffalo with a capacity for the reduction of 2 tons of ore a day. Such a plant would turn out daily 100 pounds of uranium oxide worth $2 per pound; 10,000 grams of crude radium-barium compound of 10 unit activity, due to the radium, worth about 2 cents a gram, and 100 pounds of other metallic residues, known to contain another radiant metal, polonium.

The crude radium-barium product will be converted into a chloride salt, and the process of eliminating the barium chloride begun. When the mass of 10,000 grams has been reduced to 100 grams the compound will have an activity of 1000 units, and if properly dried and sealed in a tube will glow. Upon being still further concentrated to 10 grams of 1000 units activity, it would be unsafe to carry on one's person except in a lead case. A final concentration of the 10 grams to 1 gram of 100,000 units activity will provide a compound 90 per cent. barium and 10 per cent. radium chloride.

Such a compound placed in a little aluminum shell and fitted into a lead tube of suitable thickness will provide an instrument which may be carried about by a physician in his instrument case along with a fluoroscope and will serve the functions of a roomful of X-ray generating apparatus and fixtures at no cost of operation, maintenance, renewal or repair.

Such an instrument is immediately convertible into a perpetual lamp of several candle power by removing the lead stopper from the tube and inserting in its place a hollow cylinder of cardboard or thin aluminum heavily coated on the outside with a zinc sulphide preparation. The radium rays which emerge only from the opening of the tube must all encounter this sulphide compound and will cause it to phosphoresce.

Mr. Lockwood states that he thinks that in the not distant future radium will be made as a commercial article for light producing purposes. Mr. Lockwood also states that the effectiveness of the apparatus for producing nitric acid and nitric salts from the atmosphere as used by the Atmospheric Products Company at Niagara Falls can be increased by coating with a strong solution of radium salt the surfaces in the interior of the combustion chamber, thus ozonizing it before the nitric oxides are formed.

Under the system of progressive reductions in the extraction of radium from the carnolite, which it is proposed to use at the testing plant which the company will build, the by-products of iron and copper which will be obtained will themselves be valuable.

The name of the company is the Welsh-Loftus Uranium & Rare Metals Company, incorporated under the laws of New York. Stephen T. Lockwood is president and general manager.

**Duty on Engraved Steel Plate.**—The United States General Appraisers at New York on August 18, in the protest of Theodore W. Morris & Co. against the decision of the collector of customs at New York as to the rate and amount of duties chargeable on an engraved steel plate used in the manufacture of plate glass, decided that it is dutiable under the provision in paragraph 135, tariff act of 1897, for "plates and steel in all forms and shapes not specially provided for," and not under paragraph 193 of said act, as a manufacture of metal not specially provided for. The merchandise in question consisted of a steel plate engraved with certain figures or devices, about 12 feet long, 6 inches thick and 4 feet wide, mounted like a table top upon a frame, which is moved on wheels, being used in the manufacture of plate glass. In passing upon this case the board followed a recent decision by the Circuit Court for the Southern District of New York, since acquiesced in by the Government.

## Iron and Steel in Scotland.

### The Market.

GLASGOW, August 13, 1903.—The advices from your side received in this city are very discouraging, but notwithstanding that, and the speculative reaction in the stock markets on both sides of the Atlantic, pig iron warrants have not adversely suffered, the market for Cleveland warrants, indeed, showing considerable strength. This is accounted for by the heavily oversold position in the warrant market here, and by the scarcity of No. 3 foundry iron in the Middlesbrough district, where makers' stocks of this quality are only about 7,000 tons. A heavy decrease in exports has been balanced by a large local consumption and a reduced make in the north of England.

The following shows the total pig iron stocks in public stores in the United Kingdom on the dates given:

| July 31. | July 30. | January 1, 1902. | November 30, 1900. |
|---|---|---|---|
| Tons. | Tons. | Tons. | Tons.* |
| 166,438 | 166,353 | 213,785 | 126,294 |

* Smallest quantity of iron in store during 1900.

The following are current quotations for the various Scotch brands:

| | s. | d. | | s. | d. |
|---|---|---|---|---|---|
| Coltness, No. 1 | 72 | 6 | Eglinton, No. 1 | 56 | 6 |
| Gartsherrie, No. 1 | 63 | 0 | Clyde, No. 1 | 62 | 6 |
| Summerlee, No. 1 | 68 | 0 | Carnbroe, No. 1 | 56 | 0 |
| Calder, No. 1 | 62 | 6 | Monkland, No. 1 | 55 | 6 |
| Langloan, No. 1 | 70 | 6 | Glengarnock, No. 1 | 61 | 6 |

### Shipbuilding.

The shipbuilding industry here has not yet recovered from the Fair holidays. The yards were closed for the greater part of the second half of the month and have reopened tardily. The output of the Scotch yards in July was only 17 vessels of 17,315 tons, comparing with 29,885 tons in June and with 32,022 tons in July of last year. The Clyde output was 15,903 tons, bringing the Clyde total for the seven months up to 203,700 tons. The new contracts booked in July do not amount to more than 10,000 tons, and include a 2545-ton 25-knot "scout" to be built by the Fairfield Company for the British Navy, and three new Cross Channel steamers for the Midland Railway Company to be built by John Brown & Co., Wm. Denny & Bros. and Caird & Co., respectively.

The Scotch steel companies as a rule closed their working year, 1902-3, last week, and the financial results have not been very satisfactory. It has been the worst year experienced for some time, not that trade has been bad, but because prices have been low and costs high, so that the net outcome is either loss or reduced profit. A year ago boiler plates were selling at £7 10s. per ton plus extras; to-day they are £6 net. The output of boiler plates is large, and a drop of 30 shillings a ton is bad enough, but it is made more serious by the loss of the extras. Steel ship plates were £6, less 5 per cent., a year since, and they are £5 17s. 6d. now, but in the interval they have been as low as £5 5s.

The recovery has been helped by the reduction of production through the stoppage of the Mossend Works and by a change from ship to boiler plate making at Clydebridge Works, making a difference in the Scotch supply of ship plates of between 70,000 and 80,000 tons per annum. Steel angles are being quoted £5 7s. 6d., less 5 per cent., on the 12 months, being a decline of about 5 shillings a ton. The price of Scotch hematite has advanced some shillings a ton, and the reduction in the charge for fuel does not compensate for the enhanced rate of other raw material. There is no sign of a possible early improvement in the position. Shipbuilding is in a very poor way on the Clyde, and so long as freights continue as they are at present ship owners have no inducement to add to their fleets.

### North of England.

I have just returned from a visit to the iron and steel districts in the north and midlands of England, where I found business generally only from hand to mouth, and although makers' quoted rates remain practically without change, in the open market there is much low cutting to effect sales. In pig iron buying is restricted to small quantities to cover current requirements, and prices are irregular, quotations being slightly easier in some cases. In billets there is still keen competition from the Continent, at prices ranging from about £4 6s. 6d. to £4 7s. 6d., and local makers have been taking £4 13s. 6d. Apart from the activity which is still maintained in connection with the locomotive building and electrical and engineering trades, the situation throughout the general engineering industries is unsatisfactory. Works are fairly well engaged, but there are very few shops that could not do with a good deal more work than they have in hand, while many firms are getting short of orders to keep their shops going, with comparatively little new work in prospect.

In the midlands I found that the new quarter has so far been disappointing, business being scarce and competition keen. Manufacturers were actively engaged in clearing up the orders on hand before the holiday season. Rolling stock makers are an exception to the general rule, having received some good South American contracts recently, and they are now assured full employment throughout the year.

### The Sydney Harbor Bridge.

Sir William Arrol & Co., Ltd., and one or two of our other bridge building firms are considering designs and specifications for an immense bridge which it is proposed to build across Sydney Harbor, New South Wales. Work is so far in progress to test the sustaining power of the foundation possible under the bed of the waterway. Trial cylinders are being sunk, and staging is being prepared. This question must be solved before any decision can be come to as to which design to be adopted, so that some time must elapse. B. T.

## The Susquehanna Iron & Steel Company's Affairs.

As a climax of the troubles of the Susquehanna Iron & Steel Company which have beset that corporation for some time, a petition was presented to Judge Landis at Lancaster, Pa., on August 13, by John Q. Denney, formerly general manager and recently elected director, asking that a receiver be appointed to take charge of the company's business and wind up their affairs.

Mr. Denney in his application alleged that for the past 12 months the company's accounts payable were $277,064.12, for the payment of which a large portion of their merchandise and quick assets are pledged, and that the total cash on hand for the payment of this sum is but $7934.17. He further said that the loss, as shown by the company's books for the past six months had been $74,351.75, whereby a surplus existing at the opening of the year, amounting to $57,618.92, had been entirely exhausted, leaving a deficit of $16,732.83. Notwithstanding this fact, Mr. Denney alleged, the company started the erection of the pipe mill for which it incurred a total indebtedness aggregating $278,482.10, of which $258,000 is secured by bonds, and that in addition to the above figures there is still due $44,932.67 on contracts. He complained of the large salaries paid the company's officers and the maintaining of an office in Philadelphia as useless and extravagant.

The company's answer to Mr. Denney's application denies generally that the company are insolvent. It states that the company have no more floating indebtedness than any well conducted corporation in like business might properly have; and that there is no "urgency of the demands of their creditors" as alleged by the plaintiff; and that the accounts receivable on June 30, 1903, were $186,293 and the quick assets and merchandise were $427,850, and cash $7934, together providing resources of over $600,000, with which to pay accounts payable of $277,064.

The answer further says that it is not true that a large portion of the company's merchandise and quick assets are pledged for the payment of these accounts, although since making the treasurer's report referred to, the directors secured a loan from a national bank and pledged some of the company's manufactured product and quick assets as collateral security for the repayment thereof, but the pledge of these assets does not interfere

with the conduct of the company's business. It is denied that there is any profligate, wasteful and unprofitable mismanagement of the company. The defendant further denies the allegation of the present unprofitableness of the operations of the company and lack of working capital, and avers that the maintenance of the present offices in Philadelphia is necessary.

The new pipe mill of the company was not undertaken in the unprofitable fiscal year ended June 30, 1903, but this proposition was first undertaken in 1899. The defendant's answer further avers that the allegation that the company will have to raise money to complete the pipe mill is untrue and false. According to the bill the volume of business done by the company last year was $2,000,000 gross.

## The Farwell Stool Plate Molding Machine.

The molding machine here illustrated is intended especially for stripping plate work where stooling is necessary. In molding, say, a gear wheel, the hub and rim of

THE FARWELL STOOL PLATE MOLDING MACHINE.

the pattern rest firmly upon the pattern frame at all times. This frame is securely fastened to the frame of the machine. The stripping plate rests upon adjusting studs and the stool plate is also supported upon adjusting studs while the sand is being compressed. All parts subject to strain during compression have a rigid foundation and are not supported by cranks or connecting rods. The stripping plate is fastened to rods which serve as guides for the stripping and stool plates and connect the two. This machine, which is built by the Adams Company of Dubuque, Iowa, will take flasks up to 24 inches in length by 18 inches in width.

## High Explosives; Their Safe and Economical Method of Handling.

At the recent meeting of the Lake Superior Mining Institute, J. S. Karkeet of Iron Mountain, Mich., read a paper with the above title, an abstract of which is as follows:

In no department of human energy has there been more rapid advance than in high explosives. Their rapidly extending use for various purposes has led to increases of effectiveness and adaptation to every shade of demand, until they are marvels of chemical perfection, so varied in their method of action that they are adapted to all varieties of practical work.

On account in part of the fact that cost of explosives is the least expense of drilling, the higher powered the explosive is, even though it may cost the more, the cheaper it is in practice. But strength alone is not the only desideratum in an explosive, the mode of action often being of more importance. One will rend, another will shatter, a third will heave. If we have a hard rock and wish to deal with great force on a small surface we need the high powered, concentrating explosive, and if in a soft rock we shall find that this is too local in its action, and we need a weaker or slower action. Relative costs need not be considered. As a general thing it pays to have explosives adapted to the work with regard to minor differences in cost. Another mode of action—that of heaving like gunpowder or black powder, many times more powerful—is at times desirable. It is well to use the powder requiring the smallest hole in order to save drilling. The force of black powder escapes at every crack of soft and seamy ground, whereas an instantaneous and perfectly exploding powder saves its force. Every miner knows the importance of having the most of his explosive at the bottom of the hole. The higher energy a powder has the closer it can reach the spot. In deep bore holes, where it is necessary to remove large masses, the miner has always recognized the importance of thus getting to the bottom and concentrating his charges, and the introduction of high explosives has made it possible for him to enlarge the bottom of his bore holes so as to fill them with his charge. I am a firm believer in the practice of springing or chambering holes, and think that the method will be more universal in future.

Dynamite freezes more easily than water, and when frozen cannot be loaded properly and is difficult of explosion. It must be thawed, and in this operation we encounter practically the only danger in handling dynamite. You can set it on fire and burn it up without danger, but you must never roast, toast, bake or fry it. Because a dynamite cartridge may be lit with a match and burned without explosion—most always—people suppose it can be warmed before a fire or dried on a stove. When lit with a match only a very small portion becomes hot, but when exposed to radiant heat the whole mass becomes hot to the danger point very soon. As soon as it reaches 360 degrees it will surely explode. It is better to keep it where it cannot explode at all, and this is easy enough in a mine. There are safe ways to thaw dynamite. The Rundle thawer, where the explosive is in tubes surrounded by hot water, is safe. When a mass of dynamite, as in these cartridges, is exposed to cold sufficient to cause the nitroglycerine to freeze it does not become uniformly hardened throughout. On exposure of such cartridges to sudden heat some parts of the material surrounded by still frozen dynamite will explode, and the surrounding envelope will develop the initial pressure for raising other parts to an exploding point, and so on more rapid than thought.

I have given a number of dont's to miners, one of which is not to carry matches in the same pocket with dynamite or to stick a still lighted pipe into the pocket. These seem to be needless cautions, but I find them necessary many times. Never bend back sharply so as to break the fuses, either of powder or electrical. This often results in misfire, and may be the cause of many holes firing after they have been considered dead. Often caps are put in the middle of a cartridge. There is no excuse for this, and there is decided objection, especially when using common fuse. The fuse may set fire to the stick, and it is well known that dynamite, while it will explode from fire in confined space, will not give the best results, while the resulting fumes are very much more dangerous to health than those resulting from proper explosion.

The armored cruiser "Pennsylvania" was launched at the yards of the William Cramp & Sons Ship & Engine Building Company, Philadelphia, on August 22. She has twin screws, vertical expansion engines and Niclausse boilers. The engines are expected to develop 23,000 indicated horse-power, and to sustain a speed of 22 knots an hour for four hours.

# Notes from Mexico.

### Crops and the Business Outlook.

DURANGO, August 22, 1903.—From all the States, with one exception, come favorable reports in regard to the crops. Rains have been general and the prospects are bright for an abundant harvest. From the State of Vera Cruz damage to the growing corn is reported, consequent upon the appearance of blight, which will materially reduce the production there. Despite the anxiety, in regard to the status of silver and the efforts now being made to render the currency more stable, there seems to be plenty of money in circulation, and business is everywhere active. All the signs point to a continuance throughout the year of the existing prosperity. The only adverse condition to be apprehended is a possible sudden fall in the value of silver, which would, of course, be followed by higher exchange rates and the withholding of orders for foreign commodities.

The movements of the International Monetary Commission abroad are being closely followed by business men. While so far as is known to the public no practical result has been achieved either by that body or by the commission appointed by the Government, which is still studying the question in Mexico, the feeling is general that from the rather prolonged inquest upon the white metal as a basis of currency will be evolved a practicable solution of the only disquieting problem which hampers the nation in its progressive career.

### Work of the Commission.

As previously stated in these notes, for the purpose of obtaining data to enable the monetary commission sitting in Mexico to intelligently consider the matters submitted to them by Secretary Limantour, a series of questions was addressed to the heads of the various industrial interests some time ago asking for information. The second sub-committee of the Commission has just made a report embodying the results of these inquiries. They relate to the production of metals, the cost of production and to cognate matters. The report contains many interesting statements, which invite quotation.

Replying to the question: "What is the destination or course of the different elements of mineral production —for instance: Exportation of ore, metallurgical products, bullion, coin, etc.; coin remaining in the country and forming its monetary circulation; metals consumed by the nation for industrial purposes, &c.?" the report says:

The annual mineral-metallic production of the country is exported in various forms, the following having been the exportation in 1902:

| | |
|---|---|
| Gold in coin, bullion, cyanides, sulphides, ore, dust or slimes—viz., $9,631,205.43, gold value, with $13,652,314.22 added for exchange incidental to the conversion of the gold value into silver | $23,283,519.65 |
| Silver in coin, in bullion, in lead pigs, in copper bars, in cyanides, in sulphides, slag and in ore, dust or slimes | 69,836,850.32 |
| Copper and copper ore | 18,837,397.17 |
| Lead and Lead ore | 6,140,285.90 |
| Antimony and antimony ore | 597,639.88 |
| Sundry mineral products | 239,717.05 |
| Total | $118,935,409.97 |

Or, say, $120,000,000, making allowance for differences in custom house declarations.

To the above exports of minerals it is necessary to add the increase of coined money in circulation—viz., $7,065,400; the gold and silver destined for industrial uses, $250,000; and the mercury, iron, lead, copper and other metals consumed in the country, $2,684,600; all of which items aggregate $10,000,000.

As to the present production of coal and coke, and the possible output "in the immediate future," the answer is: "We compute at 1,000,000 tons the present annual production of coal and coke in this country. We believe that the production will be 2,000,000 tons in 1905, and that it will continue progressively to increase. The output of late years has been almost exclusively from the State of Coahuila, but before long other States will be producing coal."

The following facts are given in relation to the number of employees in the various mines and reduction works, the mean rate of wages paid and the increase of wages within the past ten years:

The *personnel* employed in the metal bearing mines is 130,000 persons and in metallurgical establishments 45,000. But if to those who are directly employed in these lines, those who are indirectly employed therein, such as timbermen, dealers in fire wood, charcoal burners and freighters, who are employed exclusively in the service of the mines, though not at daily wages, be added, the *personnel* may be estimated at 200.000. These 200,000 persons, with their families, represent at least 1.000.000 individuals who owe their livelihood to the exploitation of mines and who are better off than field laborers. The mean present wages employed to workmen in mines is $1 per day and to workmen in metallurgical establishments 90 cents per day. It may be estimated that wages have increased 50 per cent. during the last ten years, and it may be added that the increase has not been uniform all over the country, as there has been no increase or very slight increase in the center of the Republic; the increase has been 50 per cent. in some remote States and from 50 to 100 per cent. in the States along the northern border.

Other questions have reference to the possible effects which a "change of legislation" would have upon the production of precious metals.

### Industrial Notes.

The Mexican company bearing the name the Compañia de Altos Hornos Mexicanos, organized early in the year with a paid up capital of $700,000, and operating a blast furnace of 200 tons daily capacity in Tepeyahualco, Puebla, have increased their capital to $1,500,000. The company own extensive iron ore deposits, and they intend to make a business of exporting iron ore in addition to manufacturing iron and steel and their products. They will build a second blast furnace and erect a Bessemer steel plant. The officers of the company are: Angel Zavalza, president; Emilio Velasco, vice-president; Emilio Segura, general manager. The principal conditions of the concession granted to Emilio Segura, the general manager of the company, covering the establishment of the Bessemer plant were published in *The Iron Age* of February 26, of this year.

The Guadalupe Oil & Development Company, one of the many companies formed some time ago to prospect for petroleum in the neighborhood of the City of Mexico, have gone into liquidation.

The Government has granted permission to the principal railway companies to increase their passenger and freight tariffs by 15 per cent., the concession to hold good until the end of the current year, providing that the rate of exchange does not fall to 220 per cent. or less within the period specified.

Exports in the ten months of the fiscal year 1902-3 were valued at $161,127,100.83, silver; in the corresponding months of the previous year they were $131,667,432.48. In the month of April of this year the exports were valued at $16,922,681.85, silver, against $16,014,352.98 in April of last year.

D. G. Farragut, who represents the Pressed Steel Car Company of America in Mexico, has opened offices at No. 8 Calle de Gante, in the City of Mexico.

Henonin Brothers of Guadalajara, Jalisco, have placed an order with the United States Shoe Mfg. Company of New York City for a complete equipment of machinery for their shoe factory.

It is reported that W. A. Desborough of San Francisco, representing California and other oil producers and refiners, intends to open a number of oil storage depots in various cities in the republic for the distribution of both crude and refined petroleum.

The Mexican Light & Power Company, who are constructing a large power plait near Huauchinango, in the State of Puebla, as noted in *The Iron Age* of April 16, are in the market for steel piping, large water wheels and other equipment.

Phillip G. Roeder of the City of Mexico, importer and manufacturers' agent in the lines of general machinery and supplies, has formed a partnership, and hereafter the firm will do business under the style of Phillip G. Roeder & Co.

The Conshos River Power Company, recently formed, have secured the concession obtained by R. M. Burke, formerly United States Consul in Chihuahua, to erect a power plant to generate electric energy for the purpose of supplying light and power to the cities of Chihuahua and Parral. The plant will be built at La Joya, 85 miles from Chihuahua. The president of the company is Frank H. Wright of Great Barrington, Mass., and the consulting engineers are the John F. Kelly Engineering Company, 149 Broadway, New York City.

Mexico City supply houses have placed orders recently with United States manufacturers, as follows: Allis-Chalmers Company, New York City, flour mill machinery; the Prescott Company of Milwaukee, Wis., a large order for pumps for mines; the Aeromotor Company of Chicago, a contract for a large number of galvanized steel towers by the Guanajauto Power & Electric Company, Limited.

The total amount of the duties collected at the various custom houses upon imported commodities has increased from $20,031,365 in the fiscal year 1891-2 to $29,691,452 in 1902-3, notwithstanding the decrease in the value of silver.

The Georgia Car & Mfg. Company of Savannah, Ga., have been given an order for a number of flat and box cars for the new line of railway, 250 miles in length, between Irapuato, Guanajuato, and Tacambaro, Michoacan, for which A. J. Peyton of New York holds the concession.

The demand for mining machinery is brisk. Several orders have recently been placed with manufacturers in the West for stamp mills and hoisting machinery. An order for gas generators for the gas plant at Merida, Yucatan, has been placed with Bate & Son of Conshohocken, Pa. J. J. D.

## Commerce of the Philippines.

### Decrease in Importations of Iron and Steel Manufactures.

WASHINGTON, D. C., August 24, 1903.—The Bureau of Insular Affairs of the War Department is in receipt of the official customs returns of the Philippine Islands for the ten months ending April 30, 1903, as compared with the corresponding period a year ago. Based on these statistics, a statement has been prepared for the press, which without additional data will be found to be misleading to the iron and steel trade, for, while the commerce of the islands shows a very gratifying increase in both imports and exports, there has been a decline in the receipts of metal manufactures, American producers bearing their full share of the loss. The total value of the import and export trade of the islands for the ten months ending April 30, 1903, was $53,703,263, while for the corresponding period of 1902 the aggregate was $46,145,981, and in 1901 it was $44,199,658. Of this gain of more than $7,500,000, by far the greater part should be credited to an increase in exports, and it is an interesting fact that the statistics for the fiscal year ending June 30, 1903, will show a balance of trade in favor of the islands for the first time since they came into the possession of the United States.

The imports into the islands for the ten months ending April 30, 1903, show an average monthly trade of nearly $2,750,000, which is somewhat in excess of the showing for the same period of 1902. Aside from the imports of rice, which were valued at nearly $7,500,000, the United States supplied over one-sixth of the import trade during the ten months referred to. The total imports aggregated $27,003,391, of which the United States supplied $3,380,855, while Asiatic countries furnished $12,432,541 and European countries $10,652,600.

#### Reduced Imports of Iron and Steel.

While the general imports of the islands increased during the ten months ending April 30, 1903, in spite of the rather depressed commercial conditions of the past year, the imports of iron and steel products clearly reflect the reduced purchasinfg power of the people. Very few items of the metal schedule show an important increase, and in the cruder forms of iron and steel the falling off has been very heavy. Notable losses are recorded in the imports of pig iron, bar iron, iron and steel rods, iron and steel rails, steel sheets and plates and structural iron. Small increases are noted in hoops and bands and in iron sheets and plates. The following figures show the imports of these articles for the ten months ending April 30, 1902 and 1903, together with the share of the United States in each item:

Pig iron, 1902, total $11,463, United States none; 1903, total $5731, United States none. Bar iron, 1902, total $53,420, United States $2720; 1903, total $45,895, United States $537. Steel bars and rods, 1902, total $36,753, United States $9132; 1903, total $33,149, United States $952. Hoops, bands, &c., 1902, total $243, United States $78; 1903, total $1106, United States $2. Iron rails, 1902, total $31,755, United States none; 1903, total, $10,754, United States none. Steel rails, 1902, total $4689, United States none; 1903, total $616, United States none. Iron sheets and plates, 1902, total $188,759, United States $1794; 1903, total $194,668, United States $1849. Steel sheets and plates, 1902, total $34,437, United States $13,916; 1903, total $25,392, United States $4368. Structural iron and steel, 1902, total $69,870, United States $193; 1903, total $38,923, United States $298.

In more highly manufactured products the average decrease is quite as great as in the cruder forms, although in certain items small increases are noted, notably wire cables, saws, firearms, cash registers, printing presses, pumps and pumping machinery, stationary engines, wire nails, pipes and fittings, safes and scales and balances. The exports from the United States have increased slightly in the articles mentioned, and also in tools, table cutlery, stoves and ranges and in miscellaneous manufactures, although the gain has been but small, as will be seen from the following figures:

Wire and wire cables, 1902, total $9131, United States $1863; 1903, total $17,814, United States $6061. Builders' hardware, 1902, total $37,160, United States $6007; 1903, total $20,731, United States $4562. Saws, 1902, total $5240, United States $1446; 1903, total $5833, United States $2657. Tools, 1902, total $77,801, United States $19,783; 1903, total $64,282, United States $22,762. Castings, 1902, total $24,963, United States $4501; 1903, total $26,447, United States, $2105. Table cutlery, 1902, total $12,407, United States $109; 1903, total $5014, United States $288. All other cutlery, 1902, total $54,466, United States $7635; 1903, total $49,597, United States $5378. Firearms, 1902, total $2331, United States $644; 1903, total $12,721, United States $1475. Cash registers, 1902, total $1258, United States $1258; 1903, total $2854, United States $2779. Electrical machinery, 1902, total $13,051, United States $11,036; 1903, total $5739, United States $3726. Laundry machinery, 1902, total, $6010, United States $4604; 1903, total $31, United States $22. Metal working machinery, 1902, total $109, United States $85; 1903, total $696, United States none. Printing presses and parts thereof, 1902, total $7289, United States $2377; 1903, total $27,538, United States $26,053. Pumps and pumping machinery, 1902, total $8551, United States $6108; 1903, total $16,468, United States $11,594. Sewing machines, 1902, total $138,913, United States $28,359; 1903, total $97,697, United States $24,149. Locomotives, 1902, total $3098, United States none; 1903, total $2565, United States $2565. Stationary engines, 1902, total $9948, United States $6427; 1903, total $24,620, United States $13,977. Boilers and parts of engines, 1902, total $87,748, United States $11,757; 1903, total $34,645, United States $5272. Typewriters, 1902, total $18,229, United States $17,126; 1903, total $17,238, United States $16,673. Sugar and brandy machinery, 1902, total $1263, United States $236; 1903, total $3693, United States $450. Other machinery and apparatus, 1902, total $206,397, United States $85,740; 1903, total $181,552, United States $69,877. Detached parts of machines and machinery, 1902, total $80,416, United States $30,649; 1903, total $70,389, United States $20,542. Cut nails and spikes, 1902, total $7848, United States $309; 1903, total $454, United States none. Wire nails, 1902, total $23,282, United States $3206; 1903, total $37,705, United States $14,375. All other nails, tacks, &c., 1902, total $11,837, United States $624; 1903, total $7282, United States $1274. Pipes and fittings, 1902, total $30,199, United States $16,580; 1903, total $30,262, United States $18,673. Safes, 1902, total $18,218, United States $6571; 1903, total $22,663, United States $12,460. Scales and balances, 1902, total $6721, United States $4772; 1903, total $13,804, United States $11,928. Stoves and ranges, 1902, total $6072, United States $1948; 1903, total $4646, United States $3187. All other manufactures of iron and steel, 1902, total $401,159, United States $41,273; 1903, total $385,549, United States $54,153.

#### For a Lower Tariff on Philippine Products

The administration is preparing to make a strong campaign at the coming session of Congress to secure the passage of a bill reducing the duties on Philippine products imported into the United States at least 50 per cent. of the Dingley rates. It is probable that the bill as introduced will provide for a reduction to 25 per cent. of the rates of the present law, but a compromise at 50 per cent. will undoubtedly be acceptable to the majority leaders of both houses. The members of the Philippine Commission assert that unless this reduction is made the increase in the importations from the United States into the islands will be very slow, if, indeed, a retrograde movement is not developed. Should the proposed bill pass, however, Governor Taft and his colleagues express the opinion that American manufacturers and exporters will secure the lion's share of the Philippine market in a very few years, as the people are strongly disposed to supply their wants from the countries to which they supply the bulk of their products. W. L. C.

# Blast Furnace Capacity Rapidly Increasing.

## To Be Increased 2,000,000 Tons the Present Year and 2,500,000 Tons Next Year.

The American Iron and Steel Association publishes the following highly interesting information relative to the blast furnaces now in course of construction in the United States:

NEW YORK—6.

Buffalo & Susquehanna Iron Company, Buffalo. Two coke stacks, each 80 x 20 feet; product, foundry pig iron; total annual capacity, 110,000 gross tons; will be ready for blast in the fall of 1903 or early in 1904.

Lackawanna Steel Company, Buffalo. Four coke stacks, Nos. 3, 4, 5 and 6, each 94 x 25½ feet; product, Bessemer pig iron; total annual capacity, 960,000 tons; No. 3 will be ready for blast February 1, No. 4 June 1, No. 5 October 1, 1904, and No. 6 February 1, 1905. (Nos. 1 and 2 were blowing on June 30.)

NEW JERSEY—1.

Wharton Furnace No. 3, Joseph Wharton, proprietor, Philadelphia. Furnace at Wharton. One anthracite and coke stack, 100 x 21 feet; product, neutral foundry, forge and basic open hearth pig iron; annual capacity, 125,000 tons; will be ready for blast in September, 1903.

PENNSYLVANIA—10.

Adrian Furnace, Rochester & Pittsburgh Coal & Iron Company, Du Bois. Furnace at Falls Creek, near Du Bois. One coke stack, 80 x 19 feet; product, foundry pig iron; annual capacity, 110,000 tons; blew in August 10, 1903.

Cambria Steel Company, Johnstown. One coke stack, 87 x 22 feet, now being erected near the Franklin steel plant of the company; product, Bessemer and basic pig iron; annual capacity, 150,000 tons; will be ready for blast in the fall of 1904. (An entirely new furnace.)

Carnegie Steel Company, Pittsburgh. Building five coke furnaces in Pennsylvania: Donora furnaces, at Donora; two stacks, each 85 x 22 feet; product, basic open hearth pig iron; total annual capacity, 365,000 tons; one furnace will be ready for blast about October 1 and the other about November 1, 1903. South Sharon furnaces, Sharon; two coke stacks, each 85 x 19 feet; product, basic pig iron; total annual capacity, 280,000 tons; will be ready for blast about October 1, 1903. New Castle Furnace No. 3, New Castle; one stack, 94½ x 21 feet; product, Bessemer pig iron; annual capacity, 182,500 tons; will be ready for blast in 1904; this furnace will take the place of the old No. 3 Furnace at New Castle, which will probably be dismantled when the new furnace is blown in.

Clairton Furnace No. 3, Clairton Steel Company, Pittsburgh. Furnace at Clairton. One coke stack, 90 x 20 feet; product, Bessemer and basic pig iron; annual capacity, 182,000 tons; will be ready for blast in September, 1903. (Nos. 1 and 2 were running on June 30.)

Eliza Furnace No. 5, Jones & Laughlin Steel Company, Pittsburgh. One coke stack, 85 x 21 feet; product, Bessemer and basic pig iron; annual capacity, 145,000 tons; will be ready for blast about January 1, 1904.

Palmerton Furnace, New Jersey Zinc Company (of Pennsylvania), South Bethlehem. One anthracite and coke stack, 60 x 14 feet; product, spiegeleisen, from zinc residuum; annual capacity, 20,000 tons; will be ready for blast early in the fall of 1903.

VIRGINIA—1.

Low Moor Iron Company of Virginia, Low Moor. One coke stack, 90 x 19 feet; product, foundry pig iron; annual capacity, 60,000 tons; blew in on July 25, 1903.

ALABAMA—6.

Alabama Steel & Wire Company, Gadsden. One coke furnace, 90 x 20 feet; product, basic or foundry pig iron; annual capacity, 110,000 tons; will be ready for blast in October, 1903. Three additional furnaces of the same size are projected.

Central Iron & Coal Company, 116 Nassau street, New York City. Furnace at Tuscaloosa. One coke stack, 85 x 18 feet; product, foundry pig iron; annual capacity, [illegible],000 tons; blew in August 4, 1903.

Ensley Furnace No. 6, Tennessee Coal, Iron & Railroad Company, Birmingham. Furnace at Ensley. One coke stack, 85 x 20 feet; product, foundry, forge and basic pig iron; annual capacity, 100,000 tons; will be ready for blast in May or June, 1904.

Gadsden-Alabama Furnace No. 2, Alabama Consolidated Coal & Iron Company, Birmingham. Furnace at Gadsden. One coke stack, 85 x 18½ feet; product, foundry and forge pig iron; annual capacity, 75,000 tons; will be ready for blast in August, 1903.

Lookout Mountain Iron Company, Battelle. One coke stack, 85 x 19 feet; product, foundry pig iron; annual capacity, 100,000 tons; will be ready for blast in January, 1904.

Woodward Iron Company, Woodward. One coke stack, 85 x 20 feet; product, foundry and forge pig iron; will be ready for blast in 1904.

OHIO—5.

Cleveland Furnace Company, Cleveland. One coke stack, 85 x 20 feet; product, foundry pig iron; annual capacity, 120,000 tons; will be ready for blast in August, 1903.

La Belle Furnace No. 2, La Belle Iron Works, Steubenville. One coke stack, 90 x 20 feet; product, basic pig iron; annual capacity, from 120,000 to 150,000 tons; will be ready for blast in February, 1904.

Lorain Furnaces, Lorain Steel Company, Lorain. Two coke stacks, Nos. 3 and 4, each 85 x 22 feet; product, Bessemer pig iron; total annual capacity, 300,000 tons; No. 3 will be ready for blast in May and No. 4 in September, 1904.

Ohio Furnace No. 4, Carnegie Steel Company, Pittsburgh, Pa. Furnace at Youngstown. One coke stack, 90 x 23 feet; product, Bessemer pig iron; annual capacity, 182,500 tons; will be ready for blast in January, 1904.

ILLINOIS—1.

South Chicago Furnace No. 2, South Chicago Furnace Company, Rookery Building, Chicago. Furnace at South Chicago. One coke stack, 80 x 19 feet; product, Bessemer and foundry pig iron; annual capacity, 125,000 tons; will be ready for blast in August, 1903.

MICHIGAN—1.

Detroit Iron & Steel Company, Detroit. Furnace on Zug Island, near Detroit. One coke stack, 78 x 18 feet; product, Bessemer, foundry, basic and malleable pig iron; annual capacity, about 100,000 tons; will be ready for blast in October, 1903.

COLORADO—1.

Minnequa Furnace (F), Colorado Fuel & Iron Company, Denver. Furnace at Pueblo. One coke stack, 85 x 20 feet; product, Bessemer pig iron; annual capacity, 130,000 tons; will be ready for blast in October, 1903.

The total number of furnaces in course of construction on June 30, 1903, was 32, of which 30, with an annual capacity of 4,197,000 tons, are to use coke alone for fuel, and 2, with an annual capacity of 145,000 tons, are to use anthracite coal and coke mixed; total annual capacity, 4,342,000 tons.

### Revived and Partly Erected Stacks.

In addition to the 32 furnaces which were under construction on June 30, 1903, three furnaces which had long been idle, and which had been practically abandoned by their owners, were being rebuilt or repaired on the date named, and work upon one partly erected furnace, the construction of which had been suspended in 1892, was about to be undertaken. These furnaces, of which two are to use charcoal for fuel, one is to use anthracite coal and coke mixed, and one is to use coke alone, are located in the following States:

NEW YORK—1.

Standish Furnace, Chateaugay Ore & Iron Company, Plattsburg. Furnace at Standish. One charcoal stack, 60 x 11 feet; product, low phosphorus pig iron; annual capacity, 25,000 tons; last active in 1892; will resume blast in September, 1903.

NEW JERSEY—1.

Secaucus Furnace, Eastern Iron Company, 39 Cortlandt street, New York. Furnace at Secaucus, N. J. One

anthracite and coke stack, 65 x 18 feet; product, foundry pig iron; annual capacity, 27,000 tons; last active in 1893; idle on June 30, but resumed blast on July 9, 1903.

VIRGINIA—2.

Fosters Falls Furnace, Virginia Iron, Coal & Coke Company, Bristol, Tenn. Furnace on the Cripple Creek branch of the Norfolk & Western Railway, in Virginia. One charcoal stack, 35 x 10 feet; product, cold blast charcoal pig iron; annual capacity, 3000 tons; last active in 1889; will resume operations in August, 1903.

Union Furnace No. 2, Union Iron & Steel Company, Empire Building, New York. Furnace at Big Stone Gap, Va. One partly erected coke stack, 75 x 18 feet; product, foundry and forge pig iron; annual capacity, 50,000 tons; furnace partly erected and work suspended in 1892; construction resumed in July, 1903, and furnace to be completed late in 1904.

**Summary.**

Adding the capacity of the building furnaces to the capacity of the partly erected and revived furnaces, it is found that by the close of 1903 the productive capacity of the completed furnaces in the country will be increased to the extent of 1,972,000 tons, and by the close of 1904 it will be further increased by 2,475,000 tons, or a total increase in the next 18 months of 4,447,000 tons, divided as follows: Coke, 4,247,000 tons; anthracite coal and coke mixed, 172,000 tons, and charcoal, 28,000 tons. Furnaces projected on June 30, 1903, or new furnaces for which ground has since been broken, if any, are not included. Nor are furnaces which are being rebuilt in whole or in part included.

Through correspondence with the owners of the furnaces above described we have ascertained that, of the 1,972,000 tons of additional capacity credited to 1903, 905,000 tons will be for sale in the general market and 1,067,000 tons will be for the use of the makers, while, of the 2,475,000 tons credited to 1904, 405,000 tons will be for the general market and 2,070,000 tons for the use of the makers. Of the grand total 1,310,000 tons, or 29.5 per cent., will be for sale, and 3,137,000 tons, or 70.5 per cent., will be for the use of the makers. Practically all of the pig iron intended for the use of the makers will be consumed in the manufacture of Bessemer and open hearth steel, while the greater portion of the pig iron intended for the general market will be used in the manufacture of iron castings, muck bars, &c.

**Total Blast Furnace Capacity.**

We estimate the annual capacity of the completed blast furnaces of the country on June 30, 1903, at 26,600,000 gross tons. If to these figures be added the annual capacity of the furnaces under construction on June 30 and of the old furnaces which were to be revived on that date a grand total of over 31,000,000 tons is reached as the approximate total yearly pig iron producing capacity of the country on December 31, 1904, when practically all the furnaces under construction on June 30, 1903, are to be ready for blast.

The capacity given above is of course largely conjectural, as it would be simply a physical impossibility for all the blast furnaces of the country to be operated at the same time. The figures serve, however, to show the total quantity of pig iron that could be made in a year if the operation of all the furnaces in the country for every day in the year were practicable. Under any circumstances we could make 24,000,000 tons next year if that quantity were needed.

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The Decimal Association is an organization established to promote the adoption of the decimal system of weights, measures and coinage in the United Kingdom. The headquarters of the association are Botolph House, Eastcheap, London, England. The secretary, Edward Johnson, has recently issued a circular letter in which he makes some interesting statements relative to the progress made in pushing the objects of the association. The membership has more than doubled during the last year, and many very prominent engineers and public men, whose names are mentioned, have identified themselves with the movement. Most of the leading engineering firms in the United Kingdom are supporting the aims of the association. Favorable action taken by a number of societies is given in detail. It is stated that nearly all the leading public schools in the country are in favor of the change. The advocates of the metric weights and measure are relying on the hearty support of Mr. Chamberlin for the reform which they urge. About one-half of the members of the House of Commons have expressed themselves as ready to support a bill for the adoption of the metric system of weights and measures, and it is confidently expected by the association that such a bill will shortly be introduced with every prospect of being passed into law.

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## Copper Production of 1902.

In his report to the United States Geological Survey on the production of copper in 1902, Charles Kirchhoff, special agent, says that the copper mining industry of the United States suffered during 1902 from the reaction which followed the unsuccessful attempt during 1901 to maintain the value of the metal at an artificial level. The collapse which came toward the close of 1901 left many producers committed to sales covering a long period at low prices, with the menace of heavy accumulations of metal constantly over the market. Yet production was heavier during 1902 than it had been in 1901, because some of the important mines were worked to full capacity and because some of the enlargements and improvements previously begun became effective during the year. Furthermore, a number of new enterprises first produced important quantities of metal. On the other hand, accidents and labor troubles cut down the outputs of some of the larger undertakings. Unless unforeseen events cause widespread or prolonged stoppage of operations at the mines, Mr. Kirchhoff thinks that the production of copper in the United States will be considerably larger in 1903 than it has ever been. The Lake Superior district will yield considerably more copper; Arizona is expected to return a considerably larger product; Utah may reach a total of 35,000,000 pounds; and Wyoming, Nevada, Colorado, New Mexico and the Southern States will report an increase.

As compared with 268,782 long tons in 1901, the total production of copper in the United States in 1902 was 294,423 long tons, of which the Lake Superior district produced 76,165, or 25.9 per cent.; Montana, 128,975 long tons, or 43.8 per cent., and Arizona, 53,547 long tons, or 18.2 per cent. This is an increase in the total production of 25,641 long tons, or nearly 10 per cent., as compared with 1901. Utah is forging to the front as one of the most important copper States, and it is notably in the Bingham Camp that development has been most rapid. Only small quantities of copper ore have been shipped from Alaska to Puget Sound smelters, but it is known that large deposits of copper ore exist, whose development is being taken seriously in hand.

The imports of copper ore in 1902 were valued at $7,921,641, as compared with $14,394,663 in 1901, and the imports of copper in bars, ingots, pigs and in manufactured forms were valued at $12,864,021, as compared with $11,820,459 in 1901. The exports of domestic copper in different forms were valued at $46,811,729 in 1902, as compared with $36,071,448 in 1901. The exports from Baltimore increased from 54,377,355 pounds in 1901 to 103,607,256 pounds in 1902, and from New York the increase was from 133,540,150 pounds in 1901 to 236,622,515 pounds in 1902.

In the aggregate the reporting mines had a stock of 155,665,652 pounds of copper on January 1, 1903, as compared with 282,014,297 pounds on January 1, 1902, a decline of over 126,000,000 pounds during 1902. The estimated consumption in 1902 was 551,688,191 pounds, as compared with 382,761,014 pounds in 1901 and with 356,891,121 pounds in 1900. The average selling price of lake copper during 1902 was 11.86 cents per pound.

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The Hoggson & Pettis Mfg. Company of New Haven, Conn., have added a line of Sweetland independent chucks to their product. The new Sweetland is a solid, heavy body, half nut, reversible jaw chuck, and is manufactured in sizes ranging from 4½ to 26 inches. It is

the intention to add other sizes to the new line as the demand requires them. The Hoggson & Pettis Company report that the trade desired a heavy chuck, and they have met the demand.

## The Pittsburgh Fuel Saving Device.

The grate bars of the fuel saving device manufactured by the Pittsburgh Fuel Saving Furnace Company of Pittsburgh are provided with a series of openings, graduating in size from the center of the bar toward each end, thus dispensing with the usual slot and obtaining a stronger and more durable bar. When applied to locomotive boilers the fire box is formed with a water jacket, the walls of which are connected by stay bolts provided with openings graduating in size from the bottom upward. Through the openings jets of steam are introduced into the furnace above the fire, to arrest the smoke and combustibles as they pass toward the flues and force them back into the fire box to be consumed. One of the steam jets is placed at the door, Fig. 3, to arrest any upward movement of the smoke toward the door when it is opened.

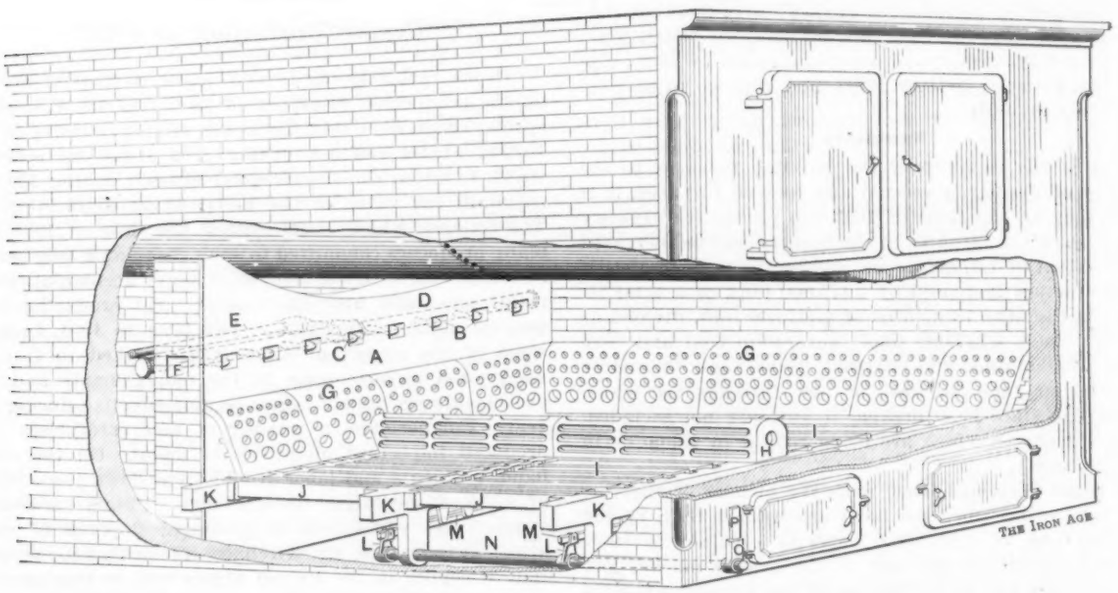
In a modified form of construction the hollow stay bolts are dispensed with and a series of pipe sections are placed horizontally, these, with the exception of the upper and lower sections, being connected by unions. These pipe sections are arranged with an intervening space between them, graduating in size upward; by this means a circulation of air is obtained and an even burning fire is the result. This is because the passage of air through the fire graduates from the bottom up.

The principal object of this furnace is to restrain the smoke until it can be consumed without in any way interfering with the natural draft.

In the construction here illustrated perforated plates are placed within the furnace. Behind the plates is an air space, which is in communication with the ash pit or outside atmosphere. The draft causes the air to be drawn within this passage and through the perforations in the plates into the furnace, and as it must necessarily pass through the fire it is heated to a very high degree before mixing with the gases within the furnace. The furnace is also surrounded with a steam pipe, through which steam is fed from the dome of the boiler. This pipe is so arranged that steam may be supplied to the sides or front or back of the furnace as required.

In locomotive fire boxes the perforated plates at the back end, or directly in front of the flues, are of greater hight than those along the sides and front, in order that steam may be fed at a point above the fire directly in front of the flues, so as to force the smoke toward the front and over the bed of fire. The plates are made in sections, so as to permit of easy renewal.

Tests of this furnace under a return tubular boiler using bituminous coal showed remarkable results. The total weight of coal used was 7350 pounds, and 20.80 pounds were burned per square foot of grate surface per hour. The total water evaporated from and at 212 degrees was 77,498 pounds. The water evaporated from




A Bridge wall.
B Steam jet openings.
C Steam jets.
D Manifold pipe.
E Live steam pipe.
F Bridge wall cavity.
G Combustion plates.
H Middle combustion bar.
I Grate bars.
J Side bearing bars.
K Bearing bars.
L Shaker jaw.
M Shaker rod.
N Shaker shaft.
O Pocket for shaker bar.
P Shaker bar.

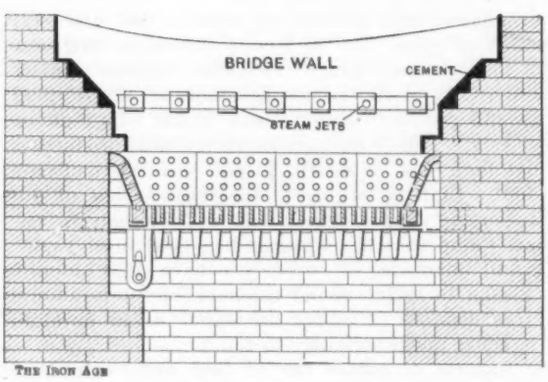



*Fig. 2.—Cross Section Looking Toward Bridge Wall.*

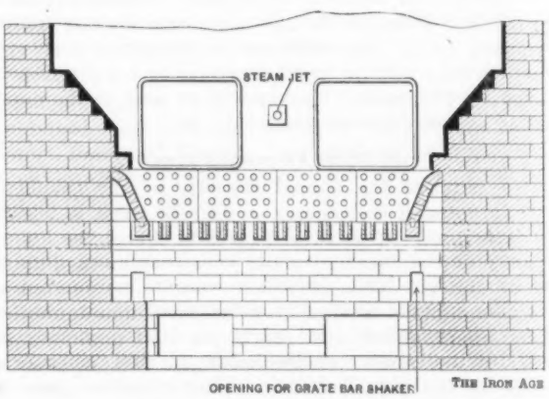



*Fig. 3.—Cross Section Looking Toward Fire Doors.*

THE PITTSBURGH FUEL SAVING DEVICE.

and at 212 degrees per pound of combustible was 11.88 pounds. The horse-power developed was 224, the builders' rating being 125. In another test, using soft coal, a record taken of the smoke stack showed that for one hour the furnace was fired seven times. The first time the smoke lasted 50 seconds; the second, 38; the third, 20; fourth, no smoke; fifth, 18 seconds; sixth, 43, and the seventh, 20 seconds.

## Marine Boiler Regulations

### Soon to Be Acted On by Secretary Cortelyou.

WASHINGTON, D. C., August 24, 1903.—The text of the regulations governing the construction and inspection of marine boilers, as revised by the Board of Supervising Inspectors of the Steamboat Inspection Service, will be transmitted within a few days to Secretary Cortelyou of the Department of Commerce and Labor by Supervising Inspector-General Uhler, and the new code will then be subjected to very careful scrutiny by the Secretary before it is finally promulgated. This will afford an opportunity to the boiler manufacturers of the country, and especially to the Legislative Committee of the American Boiler Manufacturers' Association, which has the matter in hand, to take up with the Department the question as to whether the Secretary will unite with the association in urging upon Congress the passage of a bill similar to that presented in the last session providing for the appointment of an expert commission to revise the laws and regulations relating to boilers. Secretary Cortelyou has thus far given the matter no attention, and will not do so until the text of the new code is laid before him. It will probably be several weeks before the regulations as finally approved by the Secretary are promulgated.

#### An Important Ruling.

As the result of vigorous representations made by several boiler manufacturers, and especially by the W. & A. Fletcher Company, operating the North River Iron Works at Hoboken, N. J., General Uhler has made an important ruling with regard to boiler construction, which removes one of the principal objections urged against the existing code by the committee of the American Boiler Manufacturers' Association. This point relates to the relative strength of the shell and bracing of a marine boiler, as to which the existing code of regulations requires that all braces shall be of not less strength than the shell, without regard to the pressure which the boiler is required to stand.

The attention of the Supervising Inspector-General was drawn in this connection to a specific case of a boiler built for a ferry boat which the local inspectors and the Supervising Inspector of the district had refused to pass because the shell exceeded in strength the braces, although the braces were fully equal to the pressure at which it was desired to use the boiler. In this case the boiler was double riveted, which under the regulations entitles it to 20 per cent. increase of pressure, but although no claim for such increase was made, this fact was held to prevent the approval of the authorities because there was no corresponding increase in the bracing. After considering carefully the reports of the inspectors and the representations of the manufacturers, General Uhler made the following comprehensive ruling:

> Your letter appealing from the verbal ruling of the United States local inspectors and Supervising Inspector of the New York district in relation to the building of a boiler for the ferry boat "Jamaica," the shell of which boiler you propose to make of ⅝-inch steel, and to brace as shown on the blue print, is at hand, and in reply would say that the refusal of the local inspectors at New York to approve this boiler, unless all parts have the strength of the shell, is based upon what I believe is a mistaken interpretation of the statute, and which interpretation explains the positive stand assumed by the local inspectors at New York.
>
> My understanding of the statute justifies the conclusion that the provision "that all other parts of such boiler shall correspond in strength to the additional allowances so made," clearly implies that where the claim of 20 per cent. additional pressure for double riveting of the longitudinal laps of the cylindrical parts of such boilers was allowed, then all other parts must have corresponding strength to that of the shell, but as no claim was made for any allowance, and no allowance considered, it is obvious that there is nothing contained in the statute upon which to base the demand that all other parts shall have the same strength as the shell, and I must decide that the interpretation of the statute referred to by the local inspectors at New York and concurred in by the Supervising Inspector of the Second District is not in accordance with the purpose nor the phraseology of the statute, and the restrictions cannot be justified. All boilers should be allowed working pressure in accordance with the strength of the weakest part, without reference to the strength of the shell, and all the local inspectors will be so notified.

The decision above rendered will be highly gratifying to boiler manufacturers throughout the country, who have found it extremely difficult to comply literally with the requirements of the regulations as heretofore construed. It is understood that in the revision made by board the regulation has been amended so as to relieve it of all ambiguity. W. L. C.

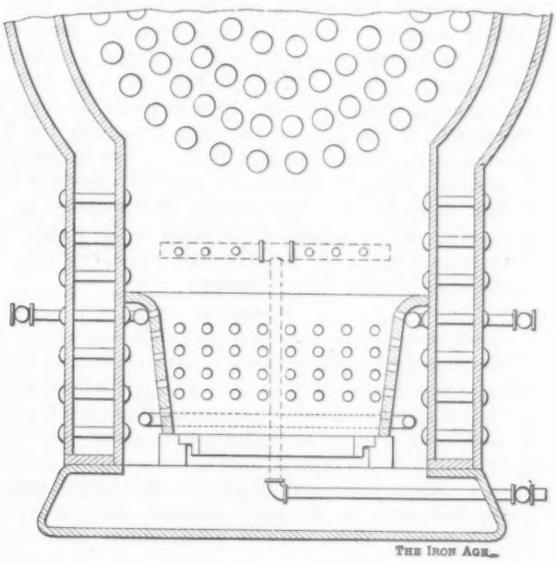



*Fig. 4.—Device Applied to B. & O. and Lake Erie R. R. Locomotives.*

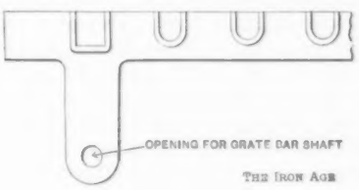



*Fig. 5.—Grate Bar Support.*

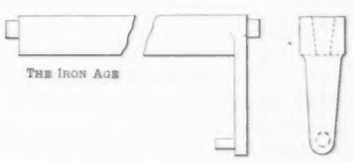



*Fig. 6.—Side and End View of Grate Bar.*

THE PITTSBURGH FUEL SAVING DEVICE.

# Drop Forging.*

BY DWIGHT GODDARD, WYMAN & GORDON COMPANY, WORCESTER, MASS.

Drop forging differs from hand forging and hammer forging, in that the shape to be formed is not obtained by slowly fashioning it with hammer, sledge, sets, fullers, flatters and other special tools, but is secured by compressing the metal in a very few blows between two dies which have been previously wrought to the desired shape.

### The Dies.

A set of dies consists of forging dies, outside trimming dies and, if there are any holes, inside trimming dies. The forging dies are the most important item. A pair of dies usually consists of two blocks of tool steel in which has been cut the shape to be forged. There are often two or more impressions in the same die block. On one side is an impression for breaking down or blocking out the metal, then a roughing impression that distributes the metal and approximates the shape and a finishing impression that brings the forging to exact shape and dimensions.

The shape and sequence of these impressions must be carefully considered to provide for a natural flowage of metal under hammering and to be such that the desired shape will be surely, quickly and economically formed. There must be no place short of metal, no overlapping and consequent "cold shuts" and no unnecessary blows or waste of stock. A draft of 5 to 7 degrees from the perpendicular must be allowed to permit a free release of the forging from the die. This is especially necessary if the section is such that an unusually quick chilling of the stock would cause the forging in shrinking to grip the die.

It requires a specially trained machinist known as a die sinker to make these dies. He must have experience and knowledge as to the action of metal under hammering, must have good judgment and high skill to enable him to plan, lay out and make the impressions. He must have a ready use of tools, both hand and machine, to reduce to a minimum the cost of the labor in making, which will be high at best. The hand tools which he uses consist of a wide range of dividers, gauges, shink rules, protractors, micrometers, riffles, chisels, files and scrapers; the machine tools, die sinking machines, sensitive drills, milling machines, profilers, shapers, &c. In designing the dies, it is always best to procure, if possible, a model of the piece to be forged. Then a full sized drawing should be made showing the draft, the allowance for finish and any changes that seem necessary, to be submitted to the customer for his approval.

When the dies are about done, as far as shaping the impression is concerned, they are clamped together and a lead cast made, as a proof of the shape. This is also sent to the customer for his approval. If satisfactory, the impressions are nicely finished to insure free release of the forging. The face of the die is cut away slightly for from ½ to 1 inch from the edges of the impression to permit the free escape of the flash or surplus metal. A groove is also made from one end of the impression to the outside to provide room for the sprue, which enables the forger to manipulate the forging by means of the bar from which the forgings are being made. Lastly, the dies are carefully hardened and tempered that they may give the maximum service.

This is a very important operation and requires great skill in accomplishing. Even hardness of the face is essential, with no cracks or warping. By this time the dies represent great value, often hundreds of dollars. They should be capable of making from 5000 to 10,000 forgings, and the breaking of dies or the early wearing away of the edges may be a costly experience. The making of the dies is the expensive part of drop forging and forbids the making in small quantities.

The customer is usually charged only a part of the cost of making the dies, and while they are kept strictly for his use, he is not permitted to remove them. In such a case the drop forger is expected to keep the dies and tools in good order and to make such repairs as are necessary and to replace them when worn out, at his own expense. The reasons for this custom are obvious. Each drop forging company has developed from this experience special methods for the designing and construction of dies, which they do not care to place at the disposal of competing companies. They are also seeking to accumulate an amount of dies that will provide them their principal business, which is forging, not die making. If a customer insists on owning the dies outright he is charged the full cost of making, with a reasonable charge for this engineering experience, and is expected to keep his own dies in repair.

### Drop Hammer.

One of these dies is secured on an anvil, or base, and the other is fastened in a head, which is free to move up and down in guides. The dies exactly match each other when together. To raise the head some hammers employ steam, some a belt or other device, but the most characteristic method is to use a board between two friction rolls. By bringing the rolls together the board is raised and hence the head, which is fastened to it.

When the head is up, the rolls are suddenly separated, which permits the board and head to freely drop. The falling weight of the head measures the force of the blow. It is under the control of the forger by his ability to limit the hight to which the head is raised before being freed to drop and also, in a measure, he can check the speed of the fall by partially clamping the board. Most drop hammers are now fitted to run automatically if desired. Drop hammers are usually classified by the weight of head—viz., 600 pounds, 1000 pounds, &c. The proportion of the weight of the head to the weight of the base is as 1 to 15 or 16. The base must rest on a deep foundation of concrete or timbers.

### Furnaces.

Each drop hammer is provided with one or two small furnaces conveniently located. Anthracite coal makes a satisfactory fuel except that it requires attention before shop hours to clean and bring to a proper heat, and also from fifteen minutes to half an hour about every two or three hours to replenish, during which time the output ceases. Natural gas and oil gas are also very satisfactory fuels, but perhaps the more common fuel is petroleum once refined. This, with a good burner and properly bricked oven, gives a hot, even heat that is economical, easily controlled, continuous and satisfactory. With either gas or oil there is no lost time for replenishing or cleaning.

With this form of furnace and fuel from 40 to 60 pounds of steel can be raised to a forging heat with 1 gallon of oil. The cost of coal we have found to be about the same as oil, but the greater output in a working day results in a considerable saving.

The furnace is bricked as small as possible consistent with heating the stock required. A single burner is placed at the rear of furnace above or below the stock hole, which is protected by a baffle to turn the flame back upon itself and evenly heat all parts of the interior. While oil fuel is now commonly used it is not yet fully tested and developed. With further experience and experiment, better results will doubtless be accomplished.

### Forging.

Sufficient stock is kept in the furnace to provide a heated bar when required. If the piece to be forged is small, the breaking down, roughing and finishing impressions are all in the same die, and the forger has but to pass it quickly from one impression to another until finished, when the flash is trimmed off in a press. If the piece is small, it is allowed to cool and the flash is trimmed afterward. If the piece to be forged is large or complicated, it is often roughed out under one hammer and passed on to another to be finished.

In such cases it is often trimmed between the roughing and finishing impressions to save unnecessary hammerings on the flash in finishing. For exceptionally large and difficult forgings the process is even more varied. The stock may need to be blocked out under a steam hammer. Then roughed out under a powerful hydraulic press. Then one end finished and trimmed. Then the piece turned, or perhaps bent, or twisted, and the other

* Paper read before the Engineers' Society of Pennsylvania, Pittsburgh, May, 1903.

end finished, it may be, from the edge. Then finally the whole struck in a single die to accurately establish the dimensions. Even after that it may require some part to be drawn out under a steam hammer or bent by hand into the final shape.

Great care is required to guard against cold shuts and insufficient stock at some troublesome corner. The drop forger has not the advantage which the blacksmith possesses of changing slightly the direction or force of a blow in order to coax the metal to the place wanted, but still there are ways of changing the roughing impression, or the flash, or the fillets, so as to attain the end desired. Metal will flow under hammer blows in the direction of least resistance and coming from two parts of the same forging will often meet in the center and form a cold shut. In this case a larger fillet or a little more stock between the two will often remedy the trouble.

**Trimming**

It is often found more economical to trim small forgings cold, in which case, if of high carbon steel, the forgings must be first annealed. For this purpose they are packed in charcoal in the usual way. Some forgings must be pickled or rattled to free them from troublesome scale.

**In General.**

The process of drop forging is necessarily limited to such shapes as can be made in dies under pressure from one direction. There are limited exceptions to this, as already indicated. It often happens that a slight change in the shape of the piece to be forged will seem insignificant to the customer but important to the forger. It may be impossible to forge otherwise, at least the change will reduce the cost of dies and making a very considerable amount. The great cost of dies, trimmers and repairs of same, when borne by a small number of forgings is prohibitive, but the number of duplicate forgings is large and the preliminary expense can be divided among thousands, the product is so even, reliable and satisfactory generally, that drop forgings are always preferred in place of hand forgings, or castings, either of steel, iron or malleable. Compared with hand forgings, drop forgings are to be preferred because of their accuracy of shape, perfect uniformity and cheapness. The slightest allowance for finish is sufficient, and parts that do not require machining need only to be polished.

Compared with steel castings, drop forgings, when possible, are to be preferred, because of their entire freedom from blow holes and consequent greater reliability. Many small pieces, in quantity, can be made more economically than steel castings, and some larger pieces when not too complicated, if wanted in sufficient numbers, can also compete in cost. Drop forgings because of their greater strength and perfect uniformity are better than malleable castings, the costs averaging about the same in quantity.

Drop forgings in quantity can also compete with cold punchings for such purposes as spur gear blanks, rings and flat shapes. The labor cost is about the same, but the greater economy of stock is a saving. The process of drop forging improves the quality of the steel because the severity of the blows necessary to force the metal into the dies is so great that it thoroughly permeates the stock. In hand forging different heats and different mechanical treatment of different parts of the same forgings, cause them to possess widely different physical properties. In drop forging the treatment is thorough and equal. The smaller forgings are refined sufficiently by hammering, but larger forgings, such as crank shafts, boiler clamps, &c., are greatly improved by annealing. In general any material that can be forged can be drop forged, low carbon steel being preferred to higher because it can be heated to higher temperature for forging, which results in longer life for the dies. The process of drop forging was at first designed for small pieces, but is being extended to larger and larger work.

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*Camp and Plant*, the weekly journal published by the sociological department of the Colorado Fuel & Iron Company, Pueblo, Col., in its issue for August 15 presents portraits of the superintendents of the different departments of that corporation. The illustrations are 24 in number and are accompanied by short biographies.

## To Test the Niclausse Boiler.

WASHINGTON, D. C., August 24, 1903.—The Navy Department has formulated a comprehensive plan for testing the Niclausse water tube boiler, which has been installed on the battle ship "Maine" and several other war vessels, the purpose being to determine conclusively the adaptability of this type for the naval service. Instructions have been issued under which the "Maine," early in September, will start on a cruise to the Azores or the Cape Verde Islands, making a run of 3000 or 4000 miles at as high a rate of speed as can conveniently be obtained without recourse to forced draft. On the return of the battle ship from this cruise it is understood that the vessel will again be subjected to the contract test of a two hours' run under forced draft. These tests will be witnessed by a board of three expert engineering officers.

In addition to testing the boilers of the "Maine," the Department has decided to have several of the boilers of the armored cruiser "Pennsylvania," when completed, set up on the dock and subjected to tests under varying conditions, and while these experiments will be less conclusive than those on board the "Maine," it is, nevertheless, expected that they will furnish the Department with very valuable data. They will also be supervised by a board of engineer officers, who will make a detailed report to the Department, noting carefully the differences between the conditions of the test and those to be encountered in ordinary sea service.

The tests above described will have a most important bearing upon the future of the navy with respect to the use of this type of boilers. The first result will be to determine whether the Niclausse boiler shall be retained in the battle ship "Maine" and in the monitor "Nevada," the only vessels now in commission in which this pattern has been employed. Even more important, however, will be the settlement of the question as to whether this boiler is to be used in the four armored cruisers "Georgia," "Virginia," "Pennsylvania" and "Colorado," now under construction, and for which Niclausse boilers have been designed. The experiments therefore will directly affect at least six war vessels now built or building.

Indirectly they will have an important bearing upon the future policy of the navy, not only with reference to this particular boiler, but as to all other types employing the Field tube or other device likely to develop "tenderness" under the conditions of sea service. The next vessels to be designed by the Department are the three 13,000-ton battle ships, the characteristics of which have been the subject of a spirited controversy for several months past. Owing to the heavy armaments designed for these ships, which are in excess of any heretofore provided for vessels of equal tonnage, it will be desirable to install boilers capable of developing the highest power with a minimum weight and bulk. On this account the Department officials would be strongly disposed to employ the Niclausse boiler in these vessels, and the forthcoming tests will therefore be observed with special interest. In view of the conclusions of the Board of Survey, which examined the battle ship "Maine" before she was ordered to be repaired several months ago, the Department would not be disposed to install this boiler in other vessels, but should the land and sea tests provided for the boilers of the "Maine" and "Pennsylvania" prove thoroughly satisfactory, the Niclausse type might be adopted for the three new battle ships and for others to be authorized by Congress hereafter. It has already been determined to equip the two 16,000-ton battle ships authorized at the last session with Babcock & Wilcox boilers, hence they will not be affected by the outcome of these experiments.

In addition to replacing the defective tubes in the boilers of the "Maine," a number of important changes have been made with a view to preventing accidents in the future and to simplifying the management of the battery. As originally constructed the steam connection to each boiler consisted of a casting bolted to the drum and having openings to which were attached the safety valves and valves for main, auxiliary and dynamo steam pipes. These valves were supposed to be automatic and to close when the pressure in the boilers became suddenly lowered, as by the bursting of a tube, but only the

valves to the main steam pipe could be closed from the deck. As it developed during the cruise of the "Maine," that these valves did not close when they should, it was decided to remove the castings referred to and replace them by others, each of which should have one opening into its boiler closed by an automatic valve, which could be operated from the fire room and from the deck. Another opening in the casting was provided for the main, auxiliary and dynamo steam pipes to be closed by ordinary automatic stop valves. The result of this change will be that it will require the closing of but one valve to shut off all connection between any one boiler and the others of the battery, and this valve in case of emergency can be closed from outside the fire room, thereby removing a serious danger to the firemen in case of the bursting of a tube or pipe.

Changes have also been made in the safety appliances to the water gauges. The spring check valves have been removed from the heads and connection to the columns made by straightway cocks having long handles, the ends of the handles being connected by chains or links extending downward and terminating in a ring. This affords a clear opening into the gauge, and when a glass breaks it is only necessary to pull down on the chain and shut off connection with the column. Other minor modifications have also been made, the Department's purpose being to put the boilers in the best possible condition so that it will be impossible to charge any unsatisfactory results to conditions which do not directly involve the design of the boiler. W. L. C.

## The Lake Superior Mining Institute.

### Ninth Annual Meeting.

ISHPEMING, MICH., August 20, 1903.—The ninth annual meeting of the Lake Superior Mining Institute was held here this week, 200 members being present. In addition to the active membership were many representatives of the Chicago & Northwestern, Chicago, Milwaukee & St. Paul and Duluth, South Shore & Atlantic roads, the entire membership of the Michigan mining commission at the St. Louis Exposition, the exposition's own mining staff and superintendents, representatives of mining and engineering journals, and others. The Nelson House, Ishpeming, was headquarters, and it was well filled during the session, which was among the most interesting and valuable in the institute's history.

### Tuesday's Proceedings.

On arrival Tuesday morning the members gathered, registered, renewed acquaintances, received detailed programmes of the convention, and made their first excursion. It was to the famous Maas shaft of the Cleveland Cliffs Company, of which Capt. J. H. Rough is in charge. The sinking of this shaft has been one of the most difficult and costly ever undertaken, and its progress for the past two years has been watched with the deepest interest. From the time quicksand was struck, near the surface, till the ledge was cut at 167 feet, the wet sand never ceased an active and tremendous movement, binding the timbers so that for weeks they moved downward. At times pumping capacity could scarcely cope with the material boiling up. A few weeks ago ledge was cut, and at such an angle that it was only with the greatest difficulty that the shaft was securely bottomed. Now it is 13 feet in rock and is steadily dropping, its danger period being past. During the progress of sinking sand for an acre or two around was sucked in, making a great crater. This is now being filled and the timbers steadied. When this is done mine buildings will be erected and the shaft properly and very heavily equipped.

After dinner the party visited some of the shafts of the Lake Superior Iron Company's mine, ownership of which is three-fourths in the Oliver Iron Mining Company and one-fourth in the Cleveland Cliffs Iron Company. At 21 mine the large Gates centrifugal crushers, the shaft houses, engine houses, &c., were inspected. The crushers are similar to those in use at many of the later plants on Lake Superior, including those of the Biwabik, Helen, Section 16, and elsewhere. The mines of the Lake Superior, Cliffs, and Lake Angeline companies, around old Lake Angeline, were visited later in the day. The old lake bottom, with its numerous cavities, caused by the operation of the caving process below, was a scene of much interest. The perfection of methods at these mines that has permitted the safe caving of ground over which laid from 15 to 25 feet of creamy mud was the subject of much comment and congratulation. The Cleveland Cliffs Company have just completed at their Lake mine a new shaft, which is to be their chief producer there as soon as it can be placed in commission, and this is now being fitted out for the work. It presented much of interest.

During the evening the first session was held. At this time the retiring president, Walter F. Fitch, read his address, which was in part as follows:

### President's Address.

"I congratulate you on the prosperity that evidently attends this organization. The large number of those directly interested in mining about Lake Superior gives promise of a still greater membership and permanence to the institute. We have now 310 members in good standing, in addition to 58 who are behind only in their dues for 1902. A very important contributing feature of the success of such an organization is the work of its secretaries, and I am confident I voice the sentiment of the membership when I extend to Mr. Yungbluth, our secretary, our congratulations on the results of his work and on his splendid annual report, recently issued.

"During the nine years of this institute it has seen a revolution in the growth of the industries it represents. Remarkable economies have been introduced, so that while the volume of tonnage of both iron and copper has increased lower costs have been reached than was ever considered possible, this even in properties where conditions have become less favorable and where workings have acquired great depth. A greater revolution still has been brought about by the consolidation of many properties by large interests. This has, it seems, brought many benefits that are apparent to all. It has been advantageous in a way that will be plainer as time passes, that of the continued steady operation of mines and the more uniform regulation of wages for employees. In the past sharp reactions, especially in iron mining, have brought unreasonably low values and compelled sharp curtailments in both wages and employment, resulting in reduced wages and constant irritation. I do not anticipate in the future an entire absence of fluctuation in the wage scale, but believe that the extremes of the past will not be repeated. We all realize that such a change will be a universal benefit.

"The claim that the United States is the country of highest labor pay and lowest costs of production is becoming more and more true every year. The Lake Superior mining districts demand the highest expertness, and are willing to pay for it. Decrease in wages never brings proportionate diminution of costs, because such decrease, unless it is universal, drives to other regions the best labor—that which is intelligent and independent. We can, therefore, all welcome the coming of the large, steadying corporations for the benefit thus promised."

A letter was read from W. J. Olcott, previous president, expressing his regret at his inability to be present.

Papers were presented during the evening as follows: By J. H. Karkeet, on "High Explosives: Their Safe and Economical Methods of Handling;" by W. M. Jeffrey, chief auditor of the Oliver Iron Mining Company, on "Mine Accounting;" by W. G. Mather, president of the Cleveland Cliffs Iron Company, on "The Charcoal Industry in Michigan;" by F. W. Denton, superintendent of the Stanton copper mines, on "A Card System for Mine Acounts;" by H. F. Ellard, mine manager, on "Sinking and Equipping No. 9 Shaft, Ashland Mine."

After the appointment of a nominating committee the evening's session adjourned.

### Wednesday and Thursday Proceedings.

Wednesday morning the members visited Marquette, where they inspected the splendid new charcoal blast furnace of the Pioneer Iron Company, and at noon took train for Munising, the beautiful location of the Cleveland Cliffs Iron Company, near the "pictured rocks of Lake Superior." Numerous launches and yachts were

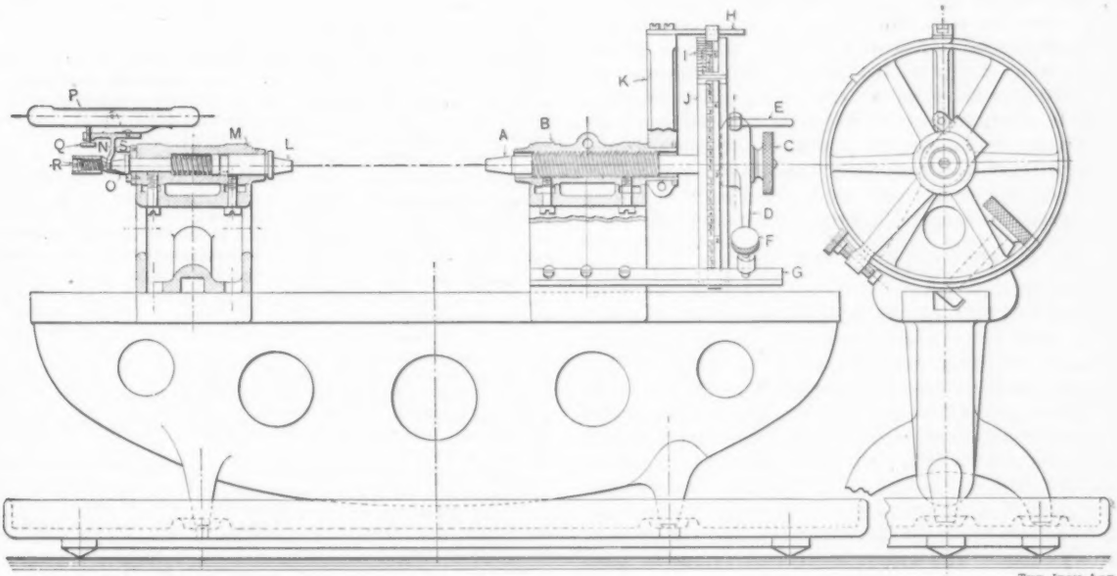
there at the disposal of the visitors, and most of them visited Grand Island, where the mining company are establishing a magnificent game preserve on a large scale. In the evening a business session was held, at which these officers were elected:

President, George H. Abeel, Hurley, Wis.; vice-presidents, J. H. McLean, Ironwood, Mich., and J. B. Cooper, Lake Linden, Mich.; secretary, A. J. Yungbluth, Ishpeming, Mich.; treasurer, E. W. Hopkins, Commonwealth, Wis. Managers, John McDowell, Hibbing, Minn., and W. J. Richards, Crystal Falls, Mich.

Reports of the Executive Council showed the institute to be in a most flourishing condition, with 460 members, of whom 92 are new. Thanks were voted to those who had contributed to the success of the meeting, and papers were read as follows: By F. W. O'Neil, on the "Champion Copper Mining Company's Intake Tunnel at Freda;" by John S. Mennie, architect of the Cleveland Cliffs Iron Company, on "A New Changing House at the Cliffs Shaft;" and by Chase S. Osborn of Sault Ste. Marie on "The Iron Ore Deposits of Arctic Lapland." At the close of the meeting the members took train for the Sault.

Thursday was spent in examining the works of the Consolidated Lake Superior Company on both sides of the Sault River. The great power house on the American side, now about ready for water, and the works of the Union Carbide Company were inspected. The blast furnaces and steel mill on the Canadian side, as well as the pulp mills, reduction works, &c., were all the center of an interested crowd. Trains on the Algoma Central road were in readiness and a trip was made north over the line. Thursday afternoon the party returned to Ishpeming or went direct to their homes, and one of the most enjoyable, successful, instructive and best planned meetings of this brilliant young organization was concluded.

D. E. W.




AN ENGLISH MEASURING MACHINE.

## An English Measuring Machine.

The following description of a new measuring machine built by the Newall Engineering Company, Limited, of 36 Featherstone street, London, is taken from the *Engineer*. These machines are essentially engineers' tools. They are made for and intended for daily use in the tool room of any well managed works. They are not, that is to say, instruments to be kept under glass cases. The fact that they are, moreover, not expensive as such machines go, is also much in their favor. The feature of greatest novelty is the use of a delicate spirit level as an indicator. The action of this little device is very pretty, and it responds to the usual tests for sensitiveness, a hand laid upon the bar or upon the bed, or a strain applied by the hand, being sufficient to cause appreciable movement of the bubble.

The 12-inch size is here shown in section. The head screw A is of a coarse pitch—ten threads per inch—and the thread is of a deep buttress form, giving a large wearing surface. The screw and nut B have equal lengths of thread to insure equal wear, and are screwed three times the length of the required movement, so that there is never less than two-thirds of the full length of thread in contact. The screw A is operated for quick movement by means of the knurled nut C. For fine movement the lever D is clamped to the spindle by an eccentric movement on the levers E, the thumb screw F thrusting against the bar G. When the eccentric lever is released, the fine adjustment lever is left hanging, and is carried along with the head screw. The vernier bar H is graduated into tenths, being the pitch of the screw A, and the vernier I is carried by the rim of the graduated wheel J along the vernier bar H.

The graduated wheel J is divided into hundredths on the right hand side and thousandths on the left, and the vernier I into ten thousandths. Readings can therefore be taken in decimal rotation, the tenths being the highest figure disclosed on the vernier bar H, the hundredths being the highest figure on the right hand side of the wheel J past zero, the thousandths being the highest figure on the left side of the wheel past zero, and ten thousandths are shown by the vernier I. The upright, carrying the vernier bar, can be moved to any convenient position when setting to zero.

Turning now to the tail stock, the anvil L is a push fit in the socket M, in which is an adjustable spring controlling the amount of pressure put on the piece being measured. The tail end of the anvil L comes in contact with the rocking lever N, which is pivoted in the bracket O. When pressure is applied to the anvil L the spirit level P is displaced. The bubble on the spirit level P is adjusted in the first place to remain at the left hand end by means of the thumb screw Q. Sufficient pressure should be applied to the piece being measured to bring the bubble up to a given graduation on the vial of the spirit level. The same method is adopted when adjusting the heads to the nearest inch by means of end rods or with rule and microscope.

The movement of the anvil L is magnified by the level P $\frac{4000}{1}$ that is to say, if the anvil is moved one thousandth—0.001 inch—the bubble would move 4 inches. The rocking lever N is kept in contact with the anvil L by a spring, which may be adjusted in the boss R of the bracket O. When the pressure is removed from the anvil L the rocking lever rests against the stop S. The head

and tail stocks are clamped to a true flat face on the bed shown in the drawing. It will be observed that the screw down bolts pull diagonally, so that the heads are clamped on the front side and top of one side of the bed. Greater accuracy is thus insured. The bed rests on three points. Three sizes of machine are made, 12-inch, 24-inch and 48-inch, and, though generally not so provided they can be fitted with rules and microscopes.

## Duty On Certain Ferro Alloys.

### Treasury Department Decides to Appeal to the Courts.

WASHINGTON, D. C., August 25, 1903.—The Secretary of the Treasury has decided to carry to the highest court a test case to determine the proper dutiable classification of ferrochrome, ferrotungsten, ferromolybdenum and ferrovanadium, products which heretofore have paid duty at the rate of $4 per ton by assimilation to ferromanganese under paragraph 122 of the tariff act, but which it is claimed should be assessed at the rate of 20 per cent. ad valorem as unwrought metals under paragraph 183. The importance of the issues involved may be gathered from the fact that in the case of ferrochrome the duty, at the rate of 20 per cent. ad valorem, would amount to about $50 per ton instead of $4. Unusual interest attaches to the case for the reason that, although the issue in court will be between the Government and the importers, the domestic producers of ferrochrome have filed a brief in which the assessment of the higher duty is urged on the ground of its necessity to afford adequate protection to the industry in this country.

#### A Long Standing Controversy.

For nearly a dozen years there has been more or less controversy over the dutiable classification of these products, which have come to be recognized as important elements in producing certain grades of steel. Owing to the fact that they were not enumerated in the tariff act of 1894 or the existing Dingley act, the customs officials and the Board of General Appraisers have shown a general disposition to invoke the similitude principle of construction and to classify them in the same general category with ferromanganese, on the ground that they are used for substantially the same purpose in the manufacture of steel. The Department from time to time has sought to levy a higher duty on these products, but in the recent case of Dana *vs.* United States the United States Circuit Court for the Southern District of New York held that ferrochrome was dutiable under paragraph 122, in similitude to ferromanganese, and taxable at $4 per ton. No appeal was taken from that decision, and duties have since been levied and collected on ferrochrome at that rate.

In a decision handed down on July 31 the Board of General Appraisers, in ruling upon an importation of ferrochrome, ferrotungsten, ferromolybdenum and ferrovanadium, held all those products to be dutiable by assimilation to ferromanganese at $4 per ton, and it was generally assumed that in view of the decision of the court in the case of Dana *vs.* United States the Department would concur in the finding. At this point, however, the domestic manufacturers of ferrochrome appealed to the Department to insist on a higher rate of duty, and filed a brief in which the functions of those various ferro alloys and their relation to metallurgy are discussed in a very interesting manner. In this brief, filed by the Willson Aluminum Company of New York, it is stated that "the company were not a party to the suit (Dana *vs.* United States), did not know of it and have in consequence no right of appeal to the courts, although deeming the decision erroneous and detrimental to their legitimate interests; but as the decision was acquiesced in by the Government the proper course is to request the Honorable the Secretary of the Treasury to reconsider the question, and if it should appear to him that the facts were not fully presented at the trial and that the decision of the Circuit Court was unsound, to take such steps as in his opinion would be proper to protect the interests of the United States."

#### Contentions of Domestic Manufacturers.

With a view to showing that the decision of the court in the Dana case was based upon erroneous assumptions as to the method by which ferrochrome is produced, and also to emphasize the costly character of the processes, the following statement is made:

Ferrochrome is extracted from chrome ore in three ways: First, in the blast furnace: second, by smelting in the crucible; and third, in the electric furnace. The ferrochrome extracted by use of the blast furnace never contains more than from 30 to 40 per cent. chromium, and the use of ferrochrome with such a low percentage of chromium is to-day limited, if it exists at all, all steel manufacturers preferring a product with a much higher chromium content, say one containing over 60 per cent. The company, as I understand, although producing ferrochrome on a large scale, have never sold any of this product containing less than 60 per cent. chromium and know of no market whatever for ferrochrome containing a lower percentage than the above. The usual commercial product of to-day averages, it would appear, approximately 67 to 72 per cent. of chromium. It follows, therefore, that the first method of extracting ferrochrome has become for commercial purposes useless.

By smelting in a crucible it is possible to obtain ferrochrome with a high chromium content but not freed from impurities. Only small quantities can be made at a time, and in view of the very high temperature special and very expensive crucibles are necessary. As a consequence of this the above process is not practicable for the production of the commercial ferrochrome.

The electric furnace, on the other hand, is capable of extracting very high grade commercial ferrochrome, and although the process is of necessity an expensive one, it is nevertheless to-day the only process by which a high grade of the article can be obtained in a sufficiently pure state and in sufficient quantities to make it of commercial value, and be it observed that it is only with the commercial product that we are here engaged, and that with the more expensive or experimental products of the laboratory or the experiment room we have no interest.

In this regard we call attention to the statement of Judge Lacombe in the case of Dana *vs.* United States, to the effect that ferrochrome is manufactured by smelting chrome ore in the blast furnace precisely as is done in the manufacture of pig iron from iron ore. That ferrochrome can be produced by this method has been seen, but that the article of commerce is not so produced is equally well known. As Judge Lacombe's decision referred solely to the commercial article, his statement does not appear to be sustained by the facts of the case. Attention is called to the above at this portion of the argument simply for the purpose of showing that as a result of this statement Judge Lacombe obtained a partial basis at least for finding that similitude existed between pig iron and the other articles enumerated in paragraph 122 and ferrochrome, as they were the result, he states, of the same process, which, unfortunately for his view, does not appear to be the case.

The present method, then, of obtaining commercial ferrochrome is the electric furnace, and it is consequently apparent that the court in the later Dana case was in error as to the industrial facts when it stated that ferrochrome is a product of the blast furnace.

#### Classification by Assimilation.

Taking up the question as to whether the similitude principle can be applied to ferrochrome and ferromanganese, the brief proceeds to show that while the latter is used in the manufacture of steel for the benefit derived from the chemical combination, the former is employed solely for the physical benefits which it imparts. In conclusion, the brief says:

We have, then, two substances, both used in the manufacture of steel. The first, ferromanganese, is added to the steel while in progress of manufacture, because of the chemical action it has on various component elements of steel. As a result of such chemical action, physical benefits are apparent in the final product, but they are not due to the physical presence of ferromanganese in the final steel, but solely and entirely to its chemical influence on those component elements. The other, ferrochrome, is used as a physical addition to the finished steel for the physical benefits which it confers thereon. Physical and chemical action are totally distinct phenomena, and the fact that the results of such processes sometimes bears a resemblance to each other is not a ground for classing the two as similar. In fact, in their very nature they are totally different from each other; they accomplish their objects by different modes of use, affect the finished products differently, and accomplish final results which are not at all similar. Such being the case, it would not seem that ferrochrome and ferromanganese are similar "either in material, quality, texture or the use to which they may be applied," and for that reason the decision of the Circuit Court of Appeals, finding that such similitude exists, is not sound and should not be followed.

Attention should be called to the fact that the intention of the legislative body should always govern in the case of ambiguity, or where it is evident that injustice or absurdity might result. The tariff laws of the United States, as has been said, are enacted for the purpose of furnishing revenue and of protecting American labor, and when it is evident that such protection as was intended is not furnished, it becomes the duty of the courts to determine whether under existing laws an adequate remedy can be had. If in the present case ferrochrome is taxed by similitude with ferromanganese, ferrosilicon, &c., at

$4 per ton, under paragraph 122 of the act of 1897, we have this rather anomalous result: Two products, ferrosilicon and ferromanganese, varying in value from $28 per ton in the former to $50 in the latter, are taxed at the rate of $4 per ton. Ferrochrome, a product whose market value is at least $250 a ton, is assessed and dutiable at the same rate. Thus we have two products, one worth about one-eighth and the other about one-fifth of the value of ferrochrome, taxed at exactly the same rate. It is true that discrepancies in tariff schedules are usually matters for Congressional action. At the same time, when it can be shown that such discrepancies need not exist, if a logical interpretation be put upon the laws, it becomes at once the duty of the courts or the executive departments to so apply the laws as to avoid discrepancies or injustice.

Obviously a duty of $4 per ton on an article worth at least $250 per ton when of the best quality affords no protection whatever to the American labor and capital engaged in its production. A plant for the production of high grade ferrochrome represents necessarily the investment of a large amount of capital. Two electrical horse-power will not produce more than a ton of ferrochrome per year, and the labor employed must be of the highest class and consequently expensive. The industry is, moreover, a new one, which under the policy of this Government should receive every protection to which it is entitled under the tariff laws.

**Collector Instructed to Appeal.**

Soon after the decision of the Board of General Appraisers of July 31 was handed down the attention of the collector of customs at New York was drawn by parties in interest to the case of Hempstead *vs.* United States, in which the United States Circuit Court of Appeals for the Third Circuit, in ruling upon the proper classification of tungsten ore, held it to be free of duty, but stated incidentally that ferrotungsten, being a product removed from the ore by at least two processes, was properly dutiable as an unwrought metal at 20 per cent. ad valorem. The collector thereupon addressed a communication to the Secretary of the Treasury, calling attention to the finding in the Hempstead case and suggesting that an appeal be taken from the decision of the board. After a careful examination of the decision cited the Secretary has directed the collector to take an appeal as follows:

The Department is in receipt of your letter of the 13th inst., inviting attention to an unpublished decision of the Board of United States General Appraisers, dated the 31st ultimo, in the matter of protests of the Roessler & Hasslacher Chemical Company, wherein it was held that certain ferrochrome, ferrotungsten, ferromolybdenum and ferrovanadium, imported under the provision of the tariff act of July 24, 1897, are properly dutiable at the rate of $4 per ton by similitude to ferromanganese, under the provisions of paragraph 122 of said act, following Dana *vs.* United States (116 Fed. Rep., 933).

You call attention to the fact that a subsequent decision of the United States Circuit Court of Appeals for the Third Circuit, in the case of Hempstead *vs.* United States (122 Fed. Rep., 538), held that similar merchandise was properly dutiable at the rate of 20 per cent. ad valorem under paragraph 183 of the act of July 24, 1897, as metals unwrought.

Under the circumstances, you are hereby directed to file an application for review of the said decision of the Board of United States General Appraisers, in accordance with the provisions of section 15 of the act of June 10, 1890.

The appeal in this case will be expedited, in the hope of obtaining a decision of the Court of Appeals at the coming term. It is probable that the case will eventually go to the United States Supreme Court. W. L. C.

## The Standard Forgings Company.

The Standard Forgings Company, organized a few months since at Chicago under the laws of Illinois, with a capital stock of $250,000, have purchased 12 acres of land at Indiana Harbor, Ind., located on the south side of the Indiana Harbor Railroad, having a frontage upon the railroad of 2400 feet, or nearly ½ mile, at a point 1200 feet west of the crossing of the Pennsylvania lines. The company will make a specialty of manufacturing heavy railway and other forgings, and heavy shafting, both of steel and iron.

Plans for the construction of a plant upon the property recently purchased have been approved, and the contract placed with A. R. Clarke & Co. of Chicago for the erection of all buildings. The contract for the structural steel has been placed with the East Chicago Bridge & Iron Works. The forge buildings, of which there are to be two, will be each 80 x 500 feet and 32 feet high. The power house will be 59 x 62 feet; the boiler house, 50 x 52 feet; the machine shop, 50 x 135 feet, and the office building, 35 x 35 feet. Stock houses and other minor buildings will be erected later. The office building will be of brick and steel; the walls of the machine shop, 10 feet of brick and the remainder covered with corrugated steel; all other buildings will be of steel construction, the roofs and sides being of corrugated galvanized iron. It is expected that the buildings will be ready for the installation of machinery the latter part of this year. Some machinery has already been purchased, and other contracts are now pending. Excellent shipping facilities are afforded by several different lines of railway, and water transportation will be available upon the completion of the canal which is now being cut through to Lake Michigan.

Frederick M. Steele is president; George E. Van Hagen, vice-president and general manager, and Carl Jerberg, superintendent. Mr. Steele was formerly president of the Chicago Forge & Bolt Company, and both Mr. Van Hagen and Mr. Jerberg were connected with the same company for upward of 20 years. Mr. Van Hagen more recently was connected with the American Bridge Company, after the sale of the Chicago Forge & Bolt Company.

## Cost of Operating Electric Rock Drills

In his annual report, John B. Hobson, general manager of the Consolidated Caribou Hydraulic Mining Company, Bullion, B. C., presents figures of cost of operating electric drills.

The plant included four drills with 2 horse-power, 110 volt, direct current portable motors, one drill, with 1½ horse-power, 110 volt direct portable motor, all complete, with 7-foot flexible shafts, adjustable tripods, drifting columns, the necessary flexible cables, working tools and five sets of drills of suitable lengths to drill holes varying from 2 to 8 feet deep. The figures are: Steam power: One cord of cedar wood, delivered, $2.25; one engineer, $4; lubricants for engine and generator, 35 cents; total, $6.60. Operating drills: Three power drill men at $4 each, $12; three helpers at $2 each, $6; one blacksmith, $4; one helper, $2; three bushels of charcoal at 25 cents, 75 cents; lubricants, 20 cents.; total, $24.95. Total cost of running three drills ten hours, $31.55. The duty attained by drills used during the season, in advancing and lowering the bed rock cut, averaged 312 feet of holes per ten-hour shift. The duty attained by two miners drilling by hand, with ⅞-inch steel and 8-pound hammers, averaged about 14 8-10 feet per ten-hour shift, and made the cost of drilling 312 feet of holes in bed rock by hand as follows: Forty-two miners at $2 per day, $84; one blacksmith at $4 per day, $4; one helper at $2 per day, $2; four bushels of charcoal at 25 cents, $1; total cost of drilling 312 feet of holes by hand, $91. Saving made in favor of power drills per ten-hour shift, $59.45.

The fourth general meeting of the American Electrochemical Society will be held at Niagara Falls, N. Y., September 17, 18 and 19, 1903. The meeting will be held at the Auditorium of the Cataract House, beginning at 9 a.m., Thursday, September 17. Thursday and Friday afternoons will be devoted to visits to power houses and certain of the electro-chemical plants which are open to visitors, and to other points of interest in the vicinity. Thursday evening there will be a smoker and entertainment at the Cataract-International. Friday evening a dance and reception at the Cataract House. Saturday evening will be devoted to a trip to Niagara-on-the-Lake, Youngstown and Port Niagara by boat and trolley.

Owing to the pleasant relationship existing between the proprietors of the Hornellsville Foundry of Hornellsville, N. Y., and their employees, rebuilding of the plant, which was recently destroyed by fire, is proceeding along most admirable lines. The owners of the plant set their molders and regular employees at work clearing away the *débris*. Now these same men are rebuilding the entire plant. In appreciation of the attitude of their employers in allowing them to participate in the work of rebuilding the men have refused to accept pay for one week's labor.

## Notes from Great Britain.

### The Markets.

LONDON, August 15, 1903.—This week a more cheerful feeling has prevailed, and prices, if anything, are a little firmer, notwithstanding the fact that foreign competition in low priced iron and steel continues keen and unrelenting. It does not appear seriously to affect the larger firms, whose turnover in most cases is up to the average of the season; but it is playing ducks and drakes with the smaller men. Perhaps this foreign competition is more a symptom of a change than an actual predisposing cause of the undoubted change which is taking place in the position of small manufacturers. They are being crushed out, and the presence on the market of foreign supplies seems to accentuate their economic position.

Owing to the continuance of cool weather this summer, the men at the iron and steel works have put in more regular time than is usually the case at this time of the year; the result of this is that better returns are being got out of machinery and economies effected on dead charges.

Current demand runs mainly upon pig, bar, chain, cable and bolt and nut iron, and quotations for the first named show increasing strength. Specifications for shipment are not plentiful, though some good orders are in hand for South Africa and parts of South America. The Australian orders are still disappointing. In this department Belgian and German competition increases in severity.

Buying at home is still from hand to mouth, and as far as I can see at the moment it is unlikely that any regular contracts will be concluded until autumn has set in.

Prices of steel are as follows: Bessemer billets, £4 15s.; Siemens billets, £4 17s. 6d.; mild steel bars, £6 7s. 6d. to £7 2s. 6d.; steel plates, £6 to £7; steel girders, £5 15s. to £6 5s.; steel angles, £5 10s. to £6 7s. 6d.

### An Ironmaster's Argument.

Joseph Ellis, managing director of the Workington Iron Company, has constructed an interesting argument relative to the heavy imports of German iron and steel which is worth recording. The imports of German steel into the United Kingdom via Dutch, Belgian and German ports reached 825,000 tons in 1902. What is the loss to Great Britain through this steel being manufactured in Germany instead of at home?

| | Tons. | | £ |
|---|---|---|---|
| Steel workers' wages on..... | 825,000 | bars, &c..... | 500,000 |
| Iron workers' wages on..... | 880,000 | pig iron..... | 176,000 |
| Coal miners', &c., wages on.. | 1,800,000 | coal for coking. | 360,000 |
| Coal miners', &c., wages on.. | 400,000 | steel work.... | 80,000 |
| Railway carriage on..... | 900,000 | coke ..... | 270,000 |
| Railway carriage on..... | 400,000 | coal ..... | 20,000 |
| Railway carriage on..... | 500,000 | limestone .... | 25,000 |
| Limestone workers' wages on. | 500,000 | limestone .... | 20,000 |
| Railway carriage on..... | 1,700,000 | ore ..... | 85,000 |
| Shipping freight, including labor and dock charges, home ports ..... | 1,700,000 | ore ..... | 500,000 |
| Loss to home trade yearly..... | | | £2,036,000 |

What about extra wages distributed by railway companies for carrying these minerals, the extra wages distributed in numerous small industries which exist in the neighborhood of large works, the great loss in railway and dock dividends, royalties, rents, &c.? What a purchasing power £2,036,000 per annum would create for Lancashire, Yorkshire and Midland goods? Mr. Chamberlain's policy will not only restore this home trade for us again, but will place British manufacturers upon an equality with Germany and the United States in the neutral markets of the world and secure us a preference in our own colonies. Let manufacturers unite and work for British unity and British trade. So runs the argument. It is Joseph Ellis', and not mine.

### The Engineering Dispute.

The anxiously looked for conference between the Engineering Federation and the Executive Council of the Amalgamated Society of Engineers took place at the end of last week. At the conclusion of the conference official communication was withheld, but it is evident from subsequent information that the masters declined to restore the reduction made in May. Since then the secretary of the Engineers' Society has circularized his branches. He says, in part:

"Your representatives put the question before the employers, and urged the restoration of the shilling reduction which had been in force since May, on the ground of improved trade and other considerations. The employers, while agreeing that trade had improved, argued that the improvement had been brought about by the reduced rates and the consequent reduced cost of production, which had taken effect not only in regard to our members, but also in regard to other trades. We declined to commit the men to any course of action, but said the whole matter would have to be discussed again by the local committees, who would doubtless deal with the matter in a dissenting frame of mind."

A good deal depends upon whether the engineers on the Clyde will keep in line with the main body. A joint conference has since been held of the various unions connected with the engineering industries as are affected on the Clyde and the northeast coast of England. A joint recommendation has been reached, the terms of which will be submitted to the men.

### The Locomotive Industry.

An interesting instance showing how a preferential tariff may occasionally work favorably comes from the locomotive industry. The Saxon Locomotive Works of Chemnitz, one of the largest locomotive engineering establishments in Germany, are now delivering at Montreal 20 powerful compound bogie express locomotives, which have been erected to the order of the Canadian Pacific Railway Company, who some few months ago divided a contract for 60 locomotives of the consolidation type between British, American and German builders, the successful firms being the North British Locomotive Company of Glasgow, the American Locomotive Company of Schenectady, N. Y., and the Saxon Locomotive Company respectively. The initial contract placed with the Glasgow builders was, however, shortly afterward supplemented by a further order for 12 locomotives, while the same firm were also successful in securing a contract for 20 additional locomotives of the celebrated consolidation type. These supplementary contracts, it is now officially stated, were, however, only secured by the Glasgow firm of builders by virtue of the operation of Canada's preferential tariff in favor of British manufacturers.

### Steam Pipe Coverings.

Some successful experiments on the efficiency of non-conducting coverings for steam pipes have been carried out in the Fulton Engineering Laboratory in the Edinburgh University. In all cases care was taken to insure that the coverings were such as are ordinarily supplied in the open market, and the apparatus used was designed by Prof. T. Hudson Beare, while the piping was a 3-inch wrought iron pipe. The results are fully set out in an article by W. N. Bolan and T. Grieve in one of this week's technical journals. The method of carrying out the experiments was as follows:

Steam was raised in the boiler to a pressure about 5 pounds higher than that at which the experiment had to be made, and the apparatus was allowed to stand for several hours under steam under the intended conditions of the experiment. All the steam condensed during that time was drawn off, but not weighed. As soon as everything was in a uniform state—that is, when the temperature of the outside of the covering ceased to rise—the experiment was started. The temperature and steam pressure readings were taken every five minutes, the condensed steam was weighed accurately every half hour, and if any experiment showed a discrepancy in the weighings the results were rejected, and a new experiment substituted. The mean atmospheric pressure was obtained from barometric readings made while the experiment was in progress, and the temperature of the steam corresponding to the mean absolute pressure was obtained from steam tables.

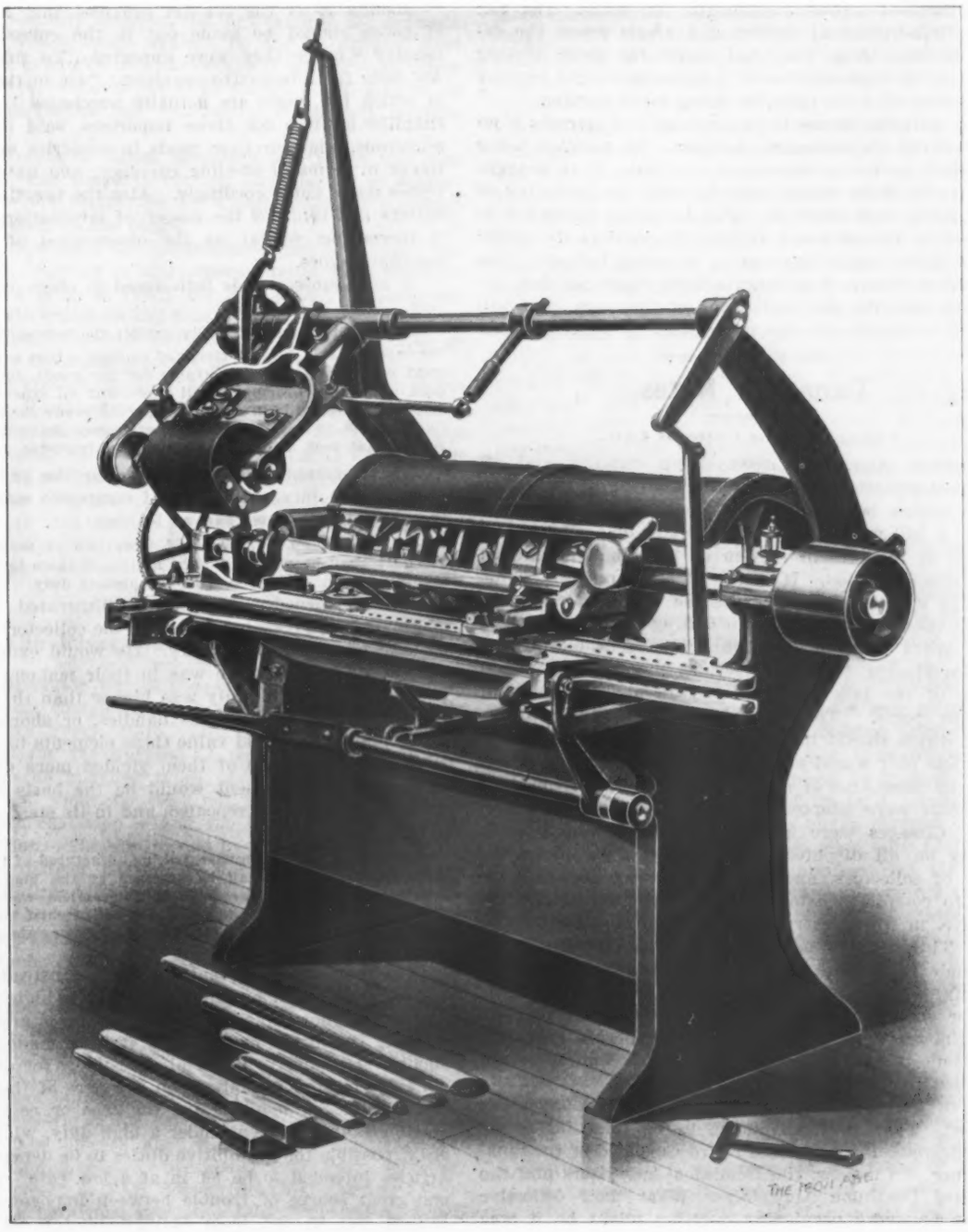
No attempt was made in this series of experiments to test the durability of the coverings or their liability to deteriorate in efficiency with time—matters of very great importance, which can only be determined by lengthy experience in the use of these various coverings; but it was

found that the condensation of steam in the uncovered pipe was from four to five and a half times greater than in a covered pipe. Thus the average of all the experiments with uncovered pipes at various pressures showed that the heat loss was 2.89 thermal units per square foot of pipe per hour per degree F. difference in temperature; in a pipe covered with slag wool only 0.595 unit, with hair and felt 0.56, with felt 0.76, and with magnesia 0.563 unit. S. G. H.

## The Defiance Automatic Handle Lathe.

In the automatic handle machine built by the Defiance Machine Works of Defiance, Ohio, the principal cutters turn the body of the work round, hexagon, octagon, square or oval, and at the same time the squaring attachment is turning an entirely different shape. To explain this more fully we will instance the turning of a hammer handle. The oval body of the handle is turned by the main cutter heads, while the eye end is turned square by a squaring attachment. A cam is placed on the head center spindle, over which the squaring attachment rides, and the shape of the work is governed by the shape of the cam. Another cam is used on the same shaft which controls the table. This cam rides against a cam shoe attached to the table, which is firmly held against it by a coiled spring, so that the work is presented to the cutters to conform exactly to the cam.

The cutter heads are fitted to a 2¼-inch steel spindle running in long babbitt bearings, and are equipped with knives having cutting edges to correspond with the shape of work to be turned. A sufficient number of heads is employed to cover the entire length of the piece to be turned. The heads and knives are numbered, so that in changing from one class of work to another it can be quickly accomplished. The table is adjustable and is constructed in two parts, forming a double table. The lower half rests upon the main frame in angle ways and is jibbed to it. The upper part, upon which the centers are mounted, is pivoted to the lower half by a steel pin in one of the several holes through the tables upon which it oscillates when performing oval turning. At the opposite end, on the head center spindle, a cast iron cam or form is placed of proper shape to suit the style of work to be turned. This cam revolves against an upright shoe extending up from the lower table, and they are held together by a coiled spring. A convenient hand lever is used for sliding the table to and from the



THE DEFIANCE AUTOMATIC HANDLE LATHE.

cutter heads. When advancing the cutter heads to a point where the turning begins the material to be turned is slowly revolved by an automatic feed; at the same time the upper table is oscillated in a path corresponding with the shape of the cam or form, and the material between the centers is turned the same shape as the cam. When the pivot which connects the tables is placed directly opposite the tail centers the machine will turn the material round at the center of oscillation and to the shape of the cam at the opposite end. In turning the same shape at both ends of the work, either round or irregular, the tables are locked together, and by the aid of a second cam shoe attached to the main frame both ends of the table may be oscillated alike. The diameter of turning can be varied from ¼ to 6 inches by simply adjusting two screws underneath the table. The tail center is adjusted by loosening a single screw the desired distance from the head center for short or long turning, and is provided with a transverse right angular adjustment with the table for doing taper turning.

The swinging cutter head advances and retreats from the work in an automatic manner. Its position being controlled by the movement of the table, it is brought down to its work simultaneously with the beginning of the turning, and when the table is moved backward to remove the turned material from the centers the cutter head is lifted out of the way by a spring balance. The machine will turn from 3000 to 3500 pieces per day, depending upon the size and shape of the work, and will handle stock up to 6 inches in diameter by 24 inches long.

## Canadian Notes.

### Changes in the Customs Law.

TORONTO, August 22, 1903.—Long standing and oft expressed dissatisfaction with the working of the Canadian Customs law has brought about a measure of reform. A bill prepared by the Minister of Customs, and enacted in the present session of Parliament, has just come into operation. It meets in some respects a demand in which the hardware trade of the country has always taken the lead. Again and again in the last 10 or 12 years have the hardware importers laid before the Government the real grievances suffered in consequence of the lack of uniformity in appraisements at different ports. They called for some authoritative guide, which should insure that the valuing of an article at one port would not differ from the valuing of exactly the same kind of article at another port. Various expedients were adopted to put an end to such differences. Changes were made in the appraising branch. Rulings on all disputed questions were placed in the hands of collectors, and an attempt was made apparently to compile a catalogue, as nearly as possible exhaustive, in which every article should be classified for duty. This did not seem to solve the difficulty. The multitude of articles was too great, and the possible permutations from the various materials were too numerous for such a method to be perfectly successful. So the Minister adopted some of the proposals that had been made to him by the hardware trade, and these are embodied in the new Act.

First, the constitution of the Board of Customs is changed. That in itself ought to be remedial in no small degree. Formerly this board consisted of the Commissioner of Customs, the Dominion Appraisers and the Assistant Dominion Appraisers. What their collective opinion on every perplexing question might be it was scarcely possible to ascertain, for the 14 or 15 members forming the board were scattered from the Atlantic to the Pacific, the Assistant Appraisers being on duty at their several posts. So distributed, the members of the board could seldom be brought together. Henceforth, according to the new Act, the Board of Customs will consist of the Commissioner and "such duly qualified officers of Customs as the Governor in Council may from time to time appoint." This means, no doubt, a smaller board, whose members will all be within easy call.

Complaint has frequently been made that the outside divisions of the service—that is, certain ports and outports—are not sufficiently attended to. The new Act gives the Minister of Customs power to authorize the employment of temporary or acting officers at such places to do duty there during the busy seasons. This will meet the needs of a number of lake ports and other points where the imports, nearly all of one kind, arrive in some short period of the year.

Power is given to the Board of Customs to declare what rate of duty is payable on any class of goods, or to declare goods exempt from duty. This power, however, is subject to an appeal to the Governor in Council, and the order in Council resulting from such appeal is to have the same effect as if the duty had been expressly prescribed by statute. This arrangement will be the means of putting an end to many a recurring difference which it formerly seemed impossible to get decided.

Section 10 of the old Act provided that all invoices of goods should be made out in the currency of the country whence they were imported. To this the new Act adds the alternative provision: "Or in the currency in which the goods are actually purchased." This will simplify matters for those importers, said to be quite numerous, who purchase goods in countries on the Continent in terms of sterling currency, and have their invoices made out accordingly. Also the practice of using dollars and cents as the money of international account is increasing, so far as the observation of Canadian merchants goes.

A new subsection is introduced to check undervaluation. It is as follows:

All invoices shall faithfully exhibit the transaction between the exporter and the importer, and contain a true and full statement of the actual price payable for the goods, including cartons, cases and coverings of all kinds, and all expenses incident to placing the goods in condition, packed ready for shipment to Canada, and no such invoice shall state any discount other than such as has been actually allowed to the importer.

An important change is made in the provision respecting the duty on articles of composite material. In the old act the clause ran as follows:

On all articles manufactured from two or more materials the duty shall be charged on the article, if there is a difference in duty, which is charged with the highest duty.

This ill-worded section may be illustrated. If a case of knives was presented for entry the collector would not at once pass them as cutlery. He would examine them carefully to see if there was in their makeup any component in which the duty was higher than that on steel. Should they have buckhorn handles, or should they be silver plated, he would value these elements in their compositions, and if one of them yielded more duty under the tariff, such element would be the basis for valuation. This section is repealed, and in its stead is the following:

On any article not enumerated, manufactured of two or more materials, the duty shall be assessed at the highest rate at which it would be chargeable if the article were composed wholly of the component material thereof of chief value, having regard to the condition of the component materials as found in the article.

This will not mend matters much. Instead of selecting the constituent on which the duty is highest the collector must now take that, whose value is greatest, and treating the mixed article as if it were made wholly of such most expensive material, classify it for duty. This calls for too much analysis on the part of the collector, and provides a loophole for the free or easy entry of goods meant to be kept under a high duty, while it renders it possible for prohibitive duties to be demanded upon articles intended to be let in at a low rate. It touches one great source of trouble between importers and collectors, but so far from extinguishing it, it probably makes it worse.

The time for making claims in respect to damaged goods is extended. Heretofore the period has been ten days from the date of landing. Now it is 14 days from the date of entry. This is a material concession, which will be appreciated by importers. It is permitted by the new law to abandon to the Crown goods so damaged as not to be deemed worth the duty to the importer. Upon goods destroyed in the custody of the customs by fire or other casualty the duty is to be refunded.

Section 16 enacts that "The Collector shall require that the true invoice from the exporter to the owner of the goods be delivered for duty purposes with the bill of

entry at the custom houses. when such goods have been sold by the exporter thereof prior to their arrival in Canada, although the goods arrive in Canada consigned to a person other than their owner."

Hereafter the Governor-in-Council shall have power to reduce or abolish the duty on articles used as material in Canadian manufactures. Formerly, the Governor-in-Council could place such articles on the free list, but not change the duty on them from one rate to another.

**Minor Notes.**

Dr. A. P. Coleman of the Ontario Bureau of Mines has returned to Toronto from a three-months' geological survey in the Sudbury district. In May his party started from Sudbury and worked north and west on a circuit of ridges in the locality. Then they operated in a southerly and westerly direction till they came to the southern Sudbury nickel range again. In the north and west ridges the existence of nickel deposits was proved. How valuable they are has yet to be found. They may be as rich in nickel as the well-known north and western ridge.

The Hulton or Moose Mountain iron range was also examined, and found to contain large bodies of magnetite. Two new companies, Dr. Coleman says, are preparing to operate in the range.

It is stated that the Londonderry Iron & Mining Company will be ready to start operations on September 10. Furnace A is to be ready for that date. Its daily capacity is described as 150 tons.

A French syndicate have bought the rolling mills at Belleville., Ont., and proposes to operate them.

At the annual meeting of the Montreal branch of the Canadian Manufacturers' Association on the 6th inst. a resolution was passed to the effect that the Government should require all persons having contracts for the construction of portions of the Grand Trunk Pacific Railway to pay the duty on articles imported for the purpose. There is an idea that as the eastern section of the road is to be built and owned by the Government, materials used in the construction of it will not be dutiable.

C. A. C. J.

## The Riverside Bridge Company.

The Riverside Bridge Company of Wheeling, W. Va., have almost completed the building of their new plant at Martin's Ferry, Ohio. This company were recently organized for the purpose of manufacturing and constructing the heaviest types of railroad and highway bridges and viaducts, steel mill and factory buildings, turntables, coal tipples and the heaviest class of steel construction. The site owned by the company is in the Wheeling district, having two sidings from the Baltimore & Ohio Railroad, two sidings from the Wheeling & Lake Erie, now a part of the Wabash system, and one siding from the Pennsylvania Railroad, all of which run immediately under the loading cranes of the plant, and which, together with the Ohio River, furnish excellent shipping facilities. The company have completed their buildings, the main bridge shop being 150 x 300 feet; the foundry, 40 x 80 feet; two machine shop buildings, 40 x 80 feet and 40 x 60 feet, and one forge shop, 30 x 80 feet. These buildings are furnished with modern machinery, electric motor driven, all of which has been installed. The officers are: N. E. Whitaker, president; Henry Schmulbach, vice-president; F. J. Park, secretary and treasurer; A. T. B. Somerville, chief engineer; C. F. Dickson, general manager, and John Vanderslice, superintendent. The plant has a capacity of 1500 tons of material a month and will employ about 200 men. The company have an office in Pittsburgh.

**Reported Extensions Denied.**—An official of the Carpenter Steel Company stated to a representative of *The Iron Age* that the reports now going the rounds of the daily press purporting to give details of proposed extensions to the Reading plant are absolutely without foundation and should be given no credit whatever. He said that at the present no improvements of importance were contemplated. The erroneous reports have it that the company will erect open hearth furnaces, blooming and wire mills. It was also stated that the company have an option on the plants and property of the Diamond State Steel Company of Wilmington, Del. This was also officially denied.

## The Reed & Prince New Shops.

The Reed & Prince Mfg. Company of Worcester, Mass., have occupied their new shops at New Worcester, and will considerably increase their product. The new buildings are of the heaviest mill construction, of brick, four stories high, with walls designed to sustain another story when the demand for more space requires it. The main section of the factory has a frontage of 250 feet and a depth of 50 feet, and from it at the rear extend three wings, respectively, 50 x 125, 50 x 100 and 50 x 50 feet. At the rear of this latter wing is the engine room, and back of it is the boiler house, a separate one-story building, 50 feet square. Two spur tracks, on trestles, enter the yard, one to the shipping room, the other to the boiler house. The company manufactures all lines of wood screws and a very complete line of machine screws. The development of the business has been remarkable. Fifteen years ago Edgard Reed and Thomas Prince started the manufacture of wood screws in a small basement room. They employed five men. In a few years they had so extended the business that a large building was erected for them by Sullivan Forehand of the Forehand Arms Company. This building became inadequate to the needs of Reed & Prince, and the new shop was built. As soon as new machinery can be installed the product will be largely increased. To-day 400 hands are employed. The company are now a Massachusetts corporation with these officers: President, Edgard Reed; treasurer, William L. Ames; secretary, E. Howard Reed; directors, these officers and Thomas Prince, who has now retired from the active management of the business.

## The Heating, Ventilating & Foundry Company.

The Heating, Ventilating & Foundry Company recently moved their plant from Wellsburg to Wheeling, W. Va. They occupy a two-story brick building, equipped with the latest improvements in foundry and machine shop practice for their line of work. The building is arranged on the continuous plan, the raw material being unloaded at one end and the finished product stored and shipped out at the opposite end, thus saving the rehandling of either the raw material or finished product. It was designed and equipped by O. L. Badger, who founded the business, and who is the patentee of large horizontal furnaces used in connection with heating and ventilating public buildings, manufacturing plants, fire place apparatus and for heating and ventilating residences, ventilated closet apparatus and apparatus for the automatic control of a volume of air. The furnace, closet and fire place apparatus are installed in the company's plant, furnishing conveniences and a good sanitary condition for the employees, as well as showing their use and merit. The furnaces are small and scientific in construction and burn soft coal without creating a smoke nuisance, this being accomplished by a secondary combustion within the furnace, which consumes the carbon and makes the furnace practically a smoke consumer. The plant was only recently finished and started. When it is in full operation it will turn out a product of 10 to 15 tons of iron per day and employ about 75 men.

The McInnes Steel Company, Limited, Corry, Pa., have put a new brand of steel on the market, which they term the McInnes extra air hard steel. This is a steel especially adapted to cutting cast iron at high speed, and is offered as an all round shop tool which will finish as well as rough. The company state that from actual tests which they have made, and from testimonials from those who have used it, the steel can be classed as one of the best high speed steels on cast iron now being offered.

The W. J. Rainey Coke Company, Cleveland, Ohio, are building 100 new coke ovens in the Connellsville region.

# The Iron Age

**New York, Thursday, August 27, 1903.**

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
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## Redemption and Taxes on Circulation.

It is highly interesting to observe that, in the East at least, and in portions of the West, the opposition to currency legislation rests upon the fact that an elastic currency is an asset currency, and the fear that an asset currency would be an inflated currency. In view of the long fight we have had to prevent the inflationists from destroying the financial system, it is curious, and in a certain respect encouraging, to find that the fear of inflation is now blocking the reform of the system it has had to struggle many years to protect.

There is no danger of inflation so long as the notes are kept constantly redeemable in gold. There is no objection to the drawing of any number of checks by bank depositors so long as they keep their checks redeemable. In addressing the New York State Bankers' Association in New York last December, the Comptroller of the Currency proposed an emergency circulation, though he admitted that he did not like the phrase, subject to a graduated tax; but he evidently did so in the belief that it was a compromise measure that might possibly get through Congress, for in the same address he said: "It is shown by experience of all countries and systems of currency that the main reliance for contraction should be redemption. It is more reliable than any tax restriction or regulation. Only through the operation of a proper system of redemption can any currency be made automatic and responsive to the demands of business. It was the constant redemption of the notes of the Suffolk system which made that currency as good as any in the world, and in most respects far better than our national bank currency."

This is perfectly true, and it is an appeal to history which demands some attention from the obstructionists. But the same lesson which we can learn from our own experience 50 years ago we can learn from Canadian experience at the present time. The leading Eastern opponent of currency relief says that if additional currency were put out in the fall to help move the crops, it would stay out and be a redundant currency in the spring and summer unless it were taxed at so high a rate that it would be issued only in a stringency, and he is not in favor of additional circulation even subject to such a tax. Yet every year we can observe the process of currency contraction in Canada effected with no circulation tax. The currency expands as the occasion arises, and therefore prevents, instead of curing, a stringency or panic. As the need declines the circulation contracts without any taxation. This phenomenon, repeated every year, ought to receive some consideration from the obstructionists, yet not one of them refers to it. Every bank is interested in keeping out as much of its own circulation as possible; therefore it returns for redemption, from day to day, the notes of other banks.

The application of this obvious law of self interest makes inflation impossible, for two reasons—namely, a bank dare not put out more notes than it can keep redeemable, and the banks in the aggregate cannot keep out a redundant circulation, because each of them is engaged in keeping down the circulation of its competitors.

There seems to be no prospect of action at the next session of Congress, for the politicians are entirely at sea, and it is feared that bankers are not united. But if the Associated Bankers of Illinois and Iowa and the Chicago Bankers' Club should agree on a plan—and Mr. Fowler says he has had encouragement in Wisconsin and Michigan, though the dispatches regarding his encounter with the Wisconsin bankers gave a different impression—Congress might be influenced. But if the leading sound money Senators are as much opposed to currency reform as Senators who have been identified with various forms of cheap money, the country will have to wait for relief.

If there should be a monetary stringency next fall, following that of last fall, in the midst of which the new House of Representatives was elected, it would make Congressional action more probable, but the country would prefer waiting for relief to a financial distress that should force a remedy. The collapse of greenbackism and silverism, and the final enactment of the gold standard, prove that in the course of time public sentiment forces upon timid politicians a correct settlement of financial problems.

## A Social Revolt Against Socialism.

In the several States of the Australian colonial federation the expected has happened. Those who have watched the development there of certain interesting experiments in State Socialism have not needed to be told that the results, as reported by those largely instrumental in bringing them about, however attractive from the academic point of view, promised practical failure when applied to the affairs of communities. The tendency of the Socialist is to fix his eyes upon some standard in which entire faith is possible, because his conclusions are not contradicted by anything in human experience, and seek its attainment at a single bound, forgetting or indifferent to the fact that the tendency of human thought is toward conservatism, that established habits of nations or communities are the result of experience in the putting forth of effort along the lines of least resistance, and that even if existing conditions are theoretically wrong they are, practically, those which come nearest to reflecting existing phases of public opinion. To change them for better habits of thought and action is possible in much the same way that nature follows in the differentiation of species. Such differentiation is never effected so suddenly as to suggest the exercise of the creative function, but represents a gradual modification of original types produced through successive generations by changes in environmental conditions, the quantity and kind of food available and the activity of natural or artificial enemies. Your Socialist reformer is impatient of the limitations which the inertia of mankind imposes upon the consummation of his schemes for human betterment. He resents the selfishness which indisposes the average man to sacrifice even a small present advantage for a possibly larger but uncertain and intangible future good, and especially to yield unreservedly to the impulse of pure altruism and surrender class advantages for the benefit of those less favored, thus assisting in furthering progress toward what has been described as the ultimate goal of advanced Socialism—an equal distribution of the wealth of the world every Saturday night. Perhaps he also forgets, or does not know, that if the great reforms he advocates were effected at single strides, the net results would not be materially different—in principle, at least—and that if the many were placed in a position in which they could effectively dominate the few who, under present condi-

tions, exercise a control wholly disproportionate to their numerical strength, even in republics, the many would forthwith proceed to oppress the few as the few have never been able to oppress the many. As it is, the majority of the controlled very freely exercise the veto power for the restraint of everything like class legislation which might result in disadvantage to them. In the new order of things the rule of the majority would have no such restraint. There could be no veto power vested in the minority which it could exercise or defend. The inevitable tendency of such a condition would be a steady progress toward communism, which would go on until it had created a state of affairs so intolerable that the majority, alarmed at the economic consequences of its own excesses, would again place itself under the leadership of those best fitted to lead, and aid in restoring some, and perhaps most, of the conditions antecedent to the socialistic revolution.

It has repeatedly been shown by human experience how easily a compact minority, consistent in the pursuit of definite objects and purposes, can control the masses, especially when it appeals to them with arguments which seem to have an altruistic basis. In every movement looking to the remodeling of the policy of a nation, state or city on Socialistic lines, this compact minority is organized labor. It is largely a Socialistic propaganda managed with no little skill by leaders who have in one way or another co-ordinated the scattered branches of the movement and unified them through national federations and conventions which are really congresses with large powers of control over the policies of local and subordinate bodies. Naturally, when a community resolves to undertake systematic experimentation in Socialism, organized labor sees its opportunity and takes the helm with entire confidence in its ability to solve every problem of government forthwith, for the greatest good of the greatest number—*i. e.*, the largest possible advantage in wages and conditions of labor for wage earners. The rights and interests of wage payers do not need to be considered. The usual result is class legislation of the most vicious and dangerous kind. Until experience has shown that such laws do not work out as well in practice as had been anticipated, and that the natural laws of trade cannot be amended or abrogated by the simple expedient of "Be it enacted," we are likely to have a saturnalia of experimental Socialism. What is certain to happen then is just what is now happening in Australia.

The social conditions existing in the several Australian States are peculiarly favorable for the development of State Socialism. They are new communities which have grown rapidly from small beginnings to impressive proportions by a steady immigration and a more than normal increase, resulting from sufficient food and ample housing accommodations which unlimited areas of cheap lands made possible. The immigrants were largely and, indeed, almost exclusively British wage earners, thoroughly indoctrinated into the esoteric principles of trade unionism, and leaving home because impatient of the restraints and limitations of established British institutions, and eager for the betterment of their condition by any means available. In Australia these people entered upon a new and wholly unfamiliar sphere of social and political influence. They became politicians, made up their local and Federal Parliaments largely from representative workingmen, and proceeded to reorganize society and government upon lines which represented the unattainable ambitions of the British trade unions. What this has brought forth in the matter of labor legislation our readers know from the occasional discussion of the subject in these columns. The outcome of the experiment has been awaited with great interest, and that it is what it is will surprise no one who has studied the industrial and commercial statistics of Australia. The communities of the several States are now organizing under new leaderships for a supreme effort to throw off the incubus of Socialism and permit a material development along lines shown by universal human experience to tend in the direction of safety and permanence.

At the approaching Federal elections, which are events of exciting interest to all concerned, the first serious effort will be made to free Australia from the increasing and already intolerable burdens of State Socialism, which are seriously impeding the material progress of the Commonwealth. Energetic reform leagues have been established in all the election districts, and candidates receiving their support are pledged to assist in restoring the principles of responsible government and undoing as much as possible the mischief accomplished by the labor party, which is committed, among other things, to the most excessive liberality in the construction of public works on the proceeds of bond issues, to provide work for the unemployed on the day-labor and minimum-wage system devised and first introduced by the Minister of Public Works in New South Wales. To continue in the way they have been going would quickly involve the colonies in hopeless bankruptcy. The burdens of taxation are already beginning to press heavily upon real estate and personal property, and that it is time to call a halt is recognized by all but the Jack Cades of the Socialistic propaganda.

There is also a purposeful revolution in progress to undo much of the vicious legislation of late years, establishing the relations of employers and workingmen on an artificial basis. The last straw to break the camel-back of public patience is the introduction in the Australian Parliament by the Federal Ministry of the Industrial Conciliation and Arbitration bill, which, if enacted, would give the Commonwealth power to interfere in and arbitrarily adjust all labor disputes extending beyond the area of a single State. This bill was born in the councils of the labor unions, and is greatly desired by them for the reason that when local strikes meet with stubborn local resistance they can, by causing strikes to be declared in the same trades in other States, command the interference of the Federal Court. This is a step in the direction of uniform wage rates and labor conditions throughout Australia, irrespective of labor supply, cost of living or other local influences affecting production.

Another bill which has aroused great resentment is the pending Federal Patents bill. This excludes from the right of importation into Australia after a period of four years any article covered by an Australian patent. Such article must be produced in Australia, or it becomes contraband in the customs houses of that country. Such legislation is an outrage upon international commercial relations. Another and less objectionable provision of this bill is that if a patent is not worked in Australia within two years of its date of issue it becomes null and void. This is to some extent a violation of international comity, but is less outrageous than the provision first noted. It also emanates from the labor party, one of the basic propositions of Socialism being that patent rights and monopoly are synonymous and contrary to public policy.

A third Federal measure inspired by the labor party is the Federal Postal act, which forbids the employment of any but white labor on mail steamers plying between Australia and foreign ports. This is designed to exclude the Lascar from competition with white firemen, trim-

mers, sailors and deck hands. Should this act be enforced it will cut down the foreign mail service to an embarrassing extent, and will be a heavy blow to the shipping trade of Sydney and Melbourne.

The arbitration system for the settlement of labor disputes, the praises of which have been sung so vociferously by Australian labor leaders and members of Parliament visiting England or America, has developed the most objectionable kind of labor protection. Before the State Industrial Arbitration Court no wage earner not belonging to a trade union is allowed a hearing, but must accept any decision of the court affecting his interests or those of his trade without protest or question. Naturally this has greatly strengthened the unions as well as multiplied the number of industrial disputes. The only recourse for the wage earner who is not in good and regular standing with a trade union is to emigrate, and the number of those who have thus been driven from the country is so great as to have attracted attention and excited alarm. The labor leaders, however, are perfectly satisfied with this condition of affairs, and their appetite for legislation of their own devising is insatiable. They now insist that there shall be but one union in any trade, and that its members shall be employed to the exclusion of nonunion men, and that union funds shall be exempt from attachment or levy under judgment.

It is not to be expected that this serious condition of affairs can be corrected at one stroke, or that the power of organized labor can be overthrown in one election; but that a practical beginning has been made in this direction is the most encouraging news that has come from Australia in a long time. Besides the reform leagues already referred to, employers are organizing into associations for mutual protection, with a determination to resist further encroachments upon the rights of property and freedom of contract, and are employing the means best calculated to make the evils of the present system apparent to all classes of voters. A fair test of the present standards of Australian civilization will be found in the length of time required to reorganize the social and political systems of that country on a safe and substantial basis of individual liberty, equal rights and governmental noninterference with legitimate private enterprise.

## The Shifting of Grain Export Channels.

The remarkable growth of New Orleans as an export point for produce, as revealed in the statistics for the fiscal year ended June 30, 1903, has naturally caused the Crescent City to aspire to greater prestige, and it is, therefore, with small wonder the news is received that a movement is on foot to establish a market at New Orleans for grain futures, such a market as gives to Chicago her preeminence in the grain trade. Some weeks since we pointed out the significant gain which had been made not only at New Orleans but at other Gulf ports, during the last fiscal year, in the export of wheat and corn, in which movement New Orleans exceeded even New York City. Later statistics, however, published during the last week by the Department of Commerce indicate that New Orleans has not been holding her own during July. While she has made wonderful strides during the seven months of the calendar year, her total exports of corn have been considerably less than those of New York. But in the export of wheat, notwithstanding a heavy decrease during July, New Orleans led New York slightly for the seven months ended July 31. Galveston also led New York and forged ahead even of New Orleans, the aggregate exports from Galveston during the first seven months this year being over 7,500,000 bushels.

A falling off in the exports of wheat and corn via the Gulf during July and August was to be anticipated, but we find that while shipments through the gateway at New Orleans did decrease materially, there was a large gain at Galveston. From this showing it is evident that the Crescent City will not reach its coveted goal without strenuous efforts, and, as in all such shifting of commercial channels, the movement will be intermittent. From a broad view, however, there can be little doubt that eventually the Gulf ports, and especially New Orleans, will supersede the Atlantic ports as shipping points for export of produce grown in the Mississippi Valley and the vast territory west of the Mississippi River.

The wonderful development of railroad interests in the Mississippi Valley and in the Southwest tends to assist New Orleans in her aspirations, and, as has been clearly pointed out, she has a powerful natural ally in the Mississippi River, which is an automatic regulator of railway charges, giving to New Orleans the benefit of continuous traffic and low rates. Whatever temporary advantage may be realized by Galveston through a combination of railways by the giving of differentials can be but short lived, owing to New Orleans' position at the mouth of the Mississippi River.

How best to accelerate the growth of New Orleans in the way to which destiny seems to be pointing is a problem now trying to be solved by the grain interests at the Crescent City. To this end it is proposed to make the port a local grain market, as well as one through which the grain passes upon through bills of lading. To provide ways and means to this end a committee of officers and prominent members of the New Orleans Board of Trade is now visiting grain centers. They will give special attention to the Chicago and New York markets. The buying and selling of options upon corn and wheat, as well as upon cotton, seem well calculated to give the necessary support to create a market wherein grain will be sold against, in the form of future deliveries, while still in transit. Hedging transactions on exports are now mainly indulged in at New York City.

In some quarters it seems to be thought that the banking facilities of New Orleans are inadequate to successfully establish and maintain such a market on the Gulf. However, New Orleans recently has demonstrated her ability to successfully handle such business, the Brown cotton corner being a test of her ability in this respect.

For the time being the grain interest at New York is much more exercised over the volume of grain exports at Montreal than the activity at New Orleans. The exports of wheat from Montreal during the first week in August were nearly four times as great as the foreign shipments from New York, while during the month of July the exports via Montreal were three times as great as the exports of wheat from New York City. This unprecedented export movement via the St. Lawrence is said to be due to extremely low rates of freight between Chicago and Montreal. In some respects Montreal and New Orleans occupy similar positions in the foreign movement of grain, the possibility of water transportation through the Canadian territory inducing, if not compelling, lower competitive rates by railways.

With these facts staring them in the face, the New York grain trade seems to be again turning to the Erie Canal with renewed hope for assistance. In its present condition the Erie Canal is almost useless as a controller of bulky traffic. By broadening and deepening the channel, and by the application of modern equipment, the canal might, at least, be an arbiter of the grain export trade, in so far as it might regulate or readjust freight

rates. But even with this assistance there is much doubt if the large volume of traffic now tending toward the Gulf could be diverted to New York City.

## CORRESPONDENCE.

### "Build" or "Manufacture."

*To the Editor:* The distinction between "building" and "manufacturing" would seem to me as clear in relation to machine tools as with reference to any other line of work. While "J. T." is quite correct in his opinion, expressed in your issue of August 20, that "construct" is the better term, especially as regards comprehension of all phases of the subject, yet there is surely good and proper use for both the other expressions.

My idea of the more general understanding of these terms is that the "construction" of a special or new machine, large or small, would be a process of "building." On the other hand, the regular "construction" of a standard machine is properly upon a "manufacturing" basis when its production, singly or in lots of two or more, is facilitated by the use of special tools, dies, jigs, &c., for the economic repetitive performance of the various operations upon its component parts.

Even the machine which, as whole, is built—a special or new tool, or one involving certain special features as modifications of a standard type—may, and generally does, include numerous manufactured parts. The degree to which a machine is manufactured, therefore, may be measured by the extent to which its construction is reduced to a manufacturing basis—a term well understood.

That large tools are more generally referred to as "built" may be due principally to the impracticability of applying manufacturing methods to their production, on account of the large sizes of various parts and the prohibitive expense of preparing special tools and appliances in cases where, usually, few duplicates are wanted, and these only at considerable intervals.

Each term, then, has its distinct meaning in the present commercial world, although the dividing line between their applicabilities in given cases may not be so clearly defined. E. C. DE W.

CHICAGO, ILL., August, 22, 1903.

### The Baraboo Iron District.

*To the Editor:* It is with deep interest I note the article in a late issue of *The Iron Age* on the "Baraboo Iron District." I take the liberty to say that the title should have been the "North Freedom Iron District." I claim the honor of making the first option on 380 acres on sections 14, 15, 22, 23, in 1887, to St. Paul parties. Owing to the heavy expense and the wave of financial depression prospecting was given up at that time, but the fact is now demonstrated that there is a heavy ore deposit lying across the township of Freedom, 10 miles west of Baraboo, and the large corporations are now coming in. The Chicago & Northwestern Railway Company expect to lay a track to the stock pile at once, some 3 miles from North Freedom. That town is the head of the iron development in Sauk County. S. A. McCOY.

NORTH FREEDOM, SAUK COUNTY, WIS., August 2, 1903.

## Metallic Phosphoro.

Metallic Phosphoro is a phosphoro tin alloy which was placed on the market about two years ago by the New Era Mfg. Company, Kalamazoo, Mich. The company claim for this product a wider field of application in the mechanical world than any of the old brands of phosphor tin. It is not only used as a flux and tempering agent in the manufacture of brass and bronze, but it has a much more expanded use in its extensive application as a tempering agent for babbitt metals.

It is claimed that the remarkable results secured by the combination of Metallic Phosphoro with other metallic alloys are due to an extraordinary tendency to increase the chemical affinity between the different elements of a mixture, which draws them together in a close, fine-grained product of uniform temper. When used in connection with babbitt metals it operates to increase their hardness and consequent wearing qualities. It is claimed that from 3 to 5 per cent. of Metallic Phosphoro added to any of the cheap, low grade babbitts will more than double their period of service.

A discovery which reduces the first cost of production, and at the same time adds to the quality of the product, can be appreciated only by those actively engaged in the industries to which it relates. The phenomenally rapid growth in favor of Metallic Phosphoro since its first introduction to public notice seems to justify the conclusion that it is possessed of real merit. It is a subject at least worthy of investigation by brass founders and consumers of babbitt metals, as their business interests make it very desirable that they should possess an accurate knowledge of an article which is so fast displacing the old product in the factories of their competitors.

## American Steel Foundries' Chicago Plant.

The American Steel Foundries recently purchased 30 acres of land in the Indiana Harbor district, lying between the tracks of the Elgin, Joliet & Eastern and Indiana Harbor railways, to which point they will remove their Chicago plant, at Fifty-ninth and Wallace streets, with such additions and improvements as will make the plant thoroughly modern and up to date in every particular. The elevation of the tracks of the Western Indiana and Pennsylvania railroads in the vicinity of the present Wallace street plant makes this change not only desirable, but almost imperative, to secure adequate shipping facilities, and the new location will also afford room for extensions and improvements.

About $175,000 will be expended in improving the recent purchase, but eventually the investment to the company at Indiana Harbor will represent $500,000. The site of the new plant is skirted on the west by the Elgin, Joliet & Eastern Railroad, and on the south by the Indiana Harbor Railway. Adjoining this property the company have also secured an option on 20 additional acres, extending up to the canal, which is now being cut through to Lake Michigan, and which, when finished, will afford transportation facilities by water.

Plans have been approved by the management for the construction of all the buildings desired for the new plant. When completed it will have a capacity of about 100 tons of finished castings per day and will employ about 500 men. The building in which will be located the molding floor and core ovens will be 62 x 500 feet, with a leanto 70 x 270 feet in length. One 20-ton acid and one 20-ton basic open hearth furnace will be located in a building 60 x 250 feet. The machine shop and power house will be located in one building, 60 x 150 feet, two stories in hight, in the upper portion of which will also be the pattern shop.

All buildings will be of steel and brick construction. In equipping the plant six electric traveling cranes will be installed, commanding the molding floor and furnace buildings. The furnaces will be charged with Wellman-Seaver charging machines and fuel oil will be used. Gas producers will also be erected for use in emergency cases. The necessary equipment required, such as boilers, engines, generators, rammers, &c., will be of the latest design, and the best type of labor saving devices will be installed wherever expedient. The entire installation will be made with the view of securing the greatest production at the greatest economy by the introduction of labor saving devices and modern equipment.

The track system will, of course, be very complete for the handling of incoming and outgoing shipments, by reason of the exceptional railroad facilities and yard room. Work is already under way at the new location and will be rushed to completion.

The steamship "San Jacinto" was launched at Chester, Pa., August 22, by the Delaware River Iron Ship Building Company of that city. This vessel is building for the Mallory Line, and will, when completed, ply between New York and Galveston, Texas. Her length over all is 400 feet, beam 53 feet, and she has a dead weight carrying capacity of 2250 tons. She will be propelled by twin screws, the contract speed being 15 knots per hour.

## Labor News.

Walking Delegate Samuel F. Parks of the Housesmiths' and Bridgemen's Union, New York, was found guilty on August 21, in Recorder Goff's Court of General Sessions, of extorting $200 on December 19, 1902, from Josephus Plenty, manufacturer of skylights, of Jersey City. Sentence has been deferred until trial can be had under other indictments against Mr. Parks for similar offenses.

The strike at the tin plate plant of the McKeesport Tin Plate Company, at Port Vue, near McKeesport, Pa., has been practically settled, the men having been defeated. At the time the tin plate scale was arranged the McKeesport Tin Plate Company agreed to pay the rate of wages called for in the Amalgamated scale, but declined to treat with that organization. The Amalgamated officials then declared a strike at the plant, but many of the men refused to stop work. Within a few weeks from the time the strike was declared, the officials of the McKeesport Tin Plate Company suceeded in getting a complement of men, and the entire plant, which contains 12 hot mills, is now in full operation.

The officials of the Amalgamated Association, at Pittsburgh, have been seriously considering the question for some time of declaring open the nonunion mills of the American Sheet Steel Company. It will be recalled that during the long strike in the summer of 1901 a number of former union sheet mills were started up nonunion and have been operated as such ever since. In fact, the most important plants of the American Sheet Steel Company are operated nonunion, among these being the Vandergrift works, at Vandergrift, Pa.; Old Meadow works, at Scottdale, Pa.; Cambridge works, at Cambridge, Ohio: Hyde Park works, at Hyde Park, Pa. The union sheet mills operated by the company are the Ætna-Standard works, at Bridgeport, Ohio, which is the largest; the Struthers works, at Struthers, Ohio; New Philadelphia works, at New Philadelphia, Ohio, and three or four small plants. A number of the nonunion sheet mills have been closed for some time, while some small ones have been dismantled and the equipment moved to Vandergrift. So many sheet mill men belonging to the Amalgamated Association are idle that the officials of the organization have about decided to declare all nonunion mills open, which would allow members of the Amalgamated Association to work in these mills and still retain their membership in good standing. Announcement of such action may be expected at any time.

The Youngstown molders' strike, embracing foundries in Youngstown, Niles and Girard, Ohio, has been settled, the men receiving a minimum rate of wages for nine hours of $3 per day, being an advance of 10 cents. The men demanded a straight advance of 10 cents per day, which was refused. The agreement made between the foundrymen and the molders is as follows:

1. That any dispute or difficulties arising between the parties hereto during the term of this agreement shall be settled strictly in accordance with the New York agreement.

2. The minimum rate of wages per day of nine hours during the term of this contract shall be $3 for journeymen molders and $2.75 for journeymen coremakers.

3. That nine hours shall constitute a day's work. All time worked over nine hours in any one day shall be considered overtime.

4. Time and a half shall be paid for all overtime and double time shall be paid on Sundays, Fourth of July, Labor Day and Christmas.

5. It shall be optional with the individual foundrymen whether the shops shall be operated on the give-and-take system or by the full number of hours, provided the give-and-take system shall be limited to 30 minutes on either side.

6. It is agreed that no restrictions shall be placed on the output of the molders in any of the foundries involved in this agreement, and that all individual castings or number of castings from one pattern or patterns heretofore produced in one day or multiple of one day shall be made at least in the same number of days.

7. The parties hereto pledge their best efforts to carry out this agreement in good faith, with the understanding that during its life the iron molders of Youngstown shall make no further demands upon the foundrymen.

8. That it is mutually agreed and understood that in case of any arrangement being made by the officers of the International Iron Molders' Union of North America and the National Founders' Association, having any reference to the question of differentials, or any other subject now under consideration by the officers of either association, it shall be made a part of this agreement, and that all parties hereto shall be bound by any national agreement that may be made or entered into between the representatives of both associations at any time during the life of this agreement.

9. This agreement shall continue in force until June 30, 1904, and unless 30 days' previous thereto notice of a desire to change any of the conditions of this agreement be given by either party thereto, then this agreement to continue and be in force until June 30 next following.

The strike at the shipbuilding yard of the Buffalo Union Dry Dock Company, affecting about 600 men of various trades connected with the shipbuilding industry, has been settled on terms satisfactory to both the company and the men. The settlement is in the nature of a compromise, but an important feature of the agreement provides a plan for the adjustment of grievances in the future, so as to avoid strikes. The issue in this strike was an increase of 2½ cents per hour in pay. The men have been idle six weeks.

The strike at the plant of the Pennsylvania Engineering Works, New Castle, Pa., has been settled and all departments of the work except one of the foundries resumed operations in full last week. The foundry is idle on account of some building operations which are being carried on at that point. The company are builders of blast furnace and steel plant construction, general machine and plate work and iron and steel cars, and have a large number of orders on their books.

A conference was held recently between the heaters in the employ of the Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio, and the managing officials. The company were represented by James A. Campbell, general manager and president; W. C. Reilly, superintendent, and John Bennington, superintendent of the skelp mill. The conference was held in an effort to come to an agreement if possible in reference to the wages of the heaters in the skelp mill. Their difference was not adjusted at the recent conference and the mill is working under the continuous scale or agreement. It was impossible for the conference to reach an agreement and another conference will be held.

About 300 machinists, out of the 1800 employees of the Westinghouse Machine Company of Pittsburgh, Pa., left their work on July 29 because of the company's refusal to make a horizontal increase in wages, as requested. The balance of the machinists, all of the molders, pattern makers, blacksmiths, carpenters, painters, electricians and other branches of mechanics, remained at their work, the conditions of employment being perfectly satisfactory to them. Of the 300 machinists who left their work on July 29, several have since returned and others are returning daily, expressing themselves as having had no sympathy whatever with the movement and being compelled only by what they at that time supposed was the will of the majority. The management permitted such men who were induced to go out against their will to return to their work at the former existing rates and without prejudice, but wish to supply the places of the ringleaders and instigators in the movement with men of better disposition. The company state that any man who applies and is engaged will be insured permanent employment if he is a satisfactory workman, and will not be displaced under any circumstances at any time to make room for any other man. The company have always followed the practice of paying the highest rate of wages prevailing in their district, which is one of the most highly paid districts in the United States.

Justice Kruse of Buffalo, in Special Term, issued an injunction restraining the strikers from the Buffalo Union Furnace Company's plant, their friends and sympathizers from committing any act of violence or other illegal act against the company, their property and employees, and from preventing men from working for the company by the use of violence or threats. Among the defendants in the proceeding, Local No. 2 of the National Association of Blast Furnace Workers was named.

About 600 employees of the Art Metal Construction Company of Jamestown, N. Y., were locked out last Friday because they threatened to strike the next day. The company state that it will be impossible for them to grant the concessions asked by the men and continue in business. They will keep the shop closed until the men decide to come back under old conditions. The shop is

the largest in the city, and is said to have been paying better wages than any other industrial establishment in Jamestown.

A call has been issued by T. J. Shaffer, president of the Amalgamated Association, for a meeting of the district vice-presidents and other officials of the association, to be held in Cleveland on August 28. The meeting is for the purpose of talking over the affairs of the association in conformity with a rule passed at the last convention, which requires annual meetings to be held.

An agreement intended to cover a period of two years has been reached between the union molders of Philadelphia and their employers who are affiliated with the National Foundrymen's Association. The text follows:

"*Whereas*, The molders of Philadelphia have asked to have a minimum rate of wages of $3.25 per day of nine hours, in place of the existing rate of $2.90 per day of ten hours for all day workers, and a 20 per cent. advance on all piece prices for a nine-hour work day, and the coremakers have asked for a minimum rate of $3 per day of nine hours for all day workers in place of the present rate of $2.50 per day of ten hours.

"*Whereas*, The foundrymen of Philadelphia believe that such an increase is without precedent and unfair; therefore be it

"*Resolved*, That this conference agrees as follows: The work day in the foundries of Philadelphia shall be nine hours for each day of the week and the minimum wages to be $2.90 per day of nine hours.

"That this agreement go into effect as of June 3, 1903, and remain in force until June 3, 1904.

"That on June 3, 1904, the minimum wage rate for molders per day of nine hours is to be increased to $3 per day.

"That on June 3, 1904, the minimum wage rate for skilled journeymen coremakers is to be increased to $2.75 per day of nine hours. This is to apply in jobbing and machinery foundries only. The present rate of wages being paid to skilled journeymen coremakers is to be continued in force from June 3, 1903, until June 3, 1904.

"That all other existing conditions in the different foundries remain the same as during the past year, and if there have been any conditions created which are obnoxious or objectionable to either employer or employee, the same are to be subject of immediate investigation and correction by the representatives of the respective organizations.

"That it is understood that any agreement reached by the two organizations, of a national character, shall be made a part of this agreement.

"This agreement shall expire June 3, 1905, and either party desiring a change at that time shall serve notice on the other 30 days in advance of the expiration of this agreement.

"It is mutually understood and agreed that when the advance in wages is given to the day work molders the same percentage of advance is to be given to the piece workers, it being understood that the advance in wages to the day work molders as well as the piece work molders is to be June 3, 1904.

"It is also further understood and agreed that 10 cents per day is to be paid to all molders and coremakers working by the day who have been employed in the foundries of the members of the National Founders' Association since June 3, 1903, up to and including August 8, 1903."

At a final conference held in the offices of the Lloyd-Booth department of the United Engineering & Foundry Company, at Youngstown, Ohio, on August 25, a scale of wages for machinists was agreed upon and all danger of a strike averted. The men originally demanded an advance of 7½ per cent., which the employers refused, stating that the present condition of business did not warrant any such advance being made in wages. After a number of conferences were held the employers agreed that for one year from August 17, 1903, an advance of 5 per cent. shall be paid to each journeyman machinist now in the employ of the parties represented in the agreement. The agreement is to remain in force until four months from August 17 and thereafter, unless the manufacturers give notice that they wish to amend this clause. There is no minimum wage rate for machinists in the Youngstown district, each shop having its own scale of wages, but the advance ranges from 15 to 20 cents per day, the men working nine hours. It was also agreed that the night shift turn shall be paid time and a quarter for all work in excess of nine hours.

## OBITUARY.

GEORGE A. BAKER, manufacturer of the Baker compass, died at his residence at Melrose, Mass., on August 20, aged 60 years. He entered business with his father in the manufacture of this compass after leaving school, and followed the business until his death.

GEORGE M. GUILD, one of the best known piano manufacturers in the country, recently died at his home at Brookline, Mass. Mr. Guild was born in 1831, and began the manufacture of the piano that bore his name in 1861. He began work on an invention known as the "American action" 18 years ago, and lived to receive his first royalties, which came within a few weeks.

JAMES A. TAYLOR, a member of the firm of William Taylor & Sons, iron manufacturers, of Brooklyn, N. Y., died on August 20 at his summer home in Cooperstown, N. Y., aged 70 years. He was born in Brooklyn, and as a young man became connected with the Continental Iron Works of that city.

CHARLES W. CUSHMAN, one of Buffalo's most prominent citizens, died in that city on August 19. Mr. Cushman was president of the Standard Iron Works and of the Columbian Equipment Company, both of Chicago, and was also president of the Railway Car Association, an association which he was largely instrumental in organizing in 1880. He was very prominent as a Free Mason.

JOHN MOHR, head of the firm of John Mohr & Sons, boiler manufacturers, of Chicago, died August 20 at his home in that city, at the age of 77 years. He was born in Germany and came to this country in 1842, settling in Chicago a few years later, and there establishing one of the largest boiler making establishments in the country. His firm have done a great deal of work in the erection of shells for blast furnaces and furnace stoves, grain storage tanks, &c. For several years the active management of the business has been in the hands of his very capable sons.

## PERSONAL.

Morris W. Lee, formerly advertising manager for Jos. T. Ryerson & Son, Chicago, and editor of *Ryerson's Monthly Journal*, has accepted a position with the Lanyon Zinc Company as assistant superintendent of their works at Iola, Kan.

The recent changes among the leading officials of the Carnegie Steel Company, at Pittsburgh, have made necessary some changes and promotions among operating officials. Harry J. Davis, who has been master mechanic in the Homestead Steel Works, has been promoted to the position of assistant to A. R. Hunt, now general manager of that plant. J. H. Horton has been appointed master mechanic to succeed Mr. Davis. William Sullivan, who has been connected with the Homestead office force, has been called to New York as secretary to William E. Corey, president of the United States Steel Corporation.

Frank J. Hearne, formerly president of the National Tube Company, and who will soon be elected president of the Colorado Fuel & Iron Company, arrived in Pittsburgh on August 23, and is spending a few days in that city. Mr. Hearne stated that he would take up his residence in Denver until the improvements and additions now being made by the Colorado Fuel & Iron Company have been completed, after which time he would probably remove to New York City and direct affairs from that place. Mr. Hearne believes that the Colorado Fuel & Iron Company have a great future.

T. F. Manville, president of the H. W. Johns-Manville Company, and family returned on the 20th inst. from a two months' trip abroad, visiting London, Paris, Berlin

and other places on the Continent. Mr. Manville was largely interested in numerous important tests of the efficiency of pipe coverings conducted by the English Government, and expects to close large contracts as a result of the showing made by the American product.

## Trade Publications.

**Lathes.**—The improvements embodied in the 10-inch tool maker's lathe, the 13-inch engine lathe and the 14-inch gibbed engine lathe built by the Pratt & Whitney Company of Hartford are described in a catalogue, just received. The bed of the tool maker's lathe is cast in one piece, with the pan, and is exceptionally deep and rigid. The two V's for the head and tail stock are smaller and lower than the V for the carriage, thus permitting the depth and strength of the carriage cross bridge to be increased. The spindle is hollow and is furnished with drawback attachment and nine hardened and ground collets for rod work, and step chucks with closers for holding short pieces of larger diameter. The end of the spindle to which the face plates are attached is threaded part of its length and the remainder made conical. The usual flange is thus dispensed with. The conical end is hardened and ground and insures absolute true running of the face plates. The carriage is of the rise and fall type, but in place of the usual weight a coil spring is provided for keeping the tension on the upper part. This construction gives a more sensitive carriage, increases the length of cross feed and permits the bed to be cross-girted. The lead screw is of large diameter and is a precision screw, the thread being cut on the company's thread milling machine. The taper turning attachment is very simple, with few working parts, and has the clamping and adjusting mechanism so located as to be readily manipulated from the front. The base on which the taper bar swivels is graduated on one end in degrees and fractional parts and on the other end in inches.

**Fire Brick and Refractories.**—The Portsmouth Harbison-Walker Company, Portsmouth, Ohio, operate works located at Portsmouth, Sciotoville and South Webster, Ohio, and at Firebrick and Olive Hill, Ky. They have a daily capacity of 250,000 chrome, magnesia, silica and high grade fire clay brick. An exceptionally handsome catalogue was naturally to be expected from such an important establishment. The publication comprises 100 pages. It is of pocket size, gilt edged and bound in flexible leather cover with flap and pocket. Illustrations are given of the numerous shapes which the company carry in stock, together with a great variety of special shapes which they manufacture for use in blast furnaces, open hearth furnaces, coke ovens, crucible melting furnaces, regenerators, lime kilns, &c. These illustrations are all printed in the natural fire brick color, bearing the dimensions in white. Tables are presented showing the proportions in which the various sizes are combined to form circles of a given diameter. Illustrations are also made of the types of blast furnace stoves in general use and the method in which the fire bricks of special construction are built in each. Tables are given showing the melting temperatures of iron, steel and other metals; the temperatures of the Bessemer and open hearth processes; the temperature of a blast furnace in manufacturing Bessemer pig iron; circumferences and areas of circles, from one sixty-fourth to fifty; weights of various materials, and weights and measures, including the metric system.

**Tobin Bronze.**—A timely publication is a description of the America's Cup and the contests which have been held for the possession of that trophy down to the present year, published in a very attractive pamphlet by the Ansonia Brass & Copper Company, 99 John street, New York. The company furnished the Tobin bronze used in the construction of the hulls of the "Vigilant," "Independence," "Constitution," "Columbia," and "Reliance," all specially built for the purpose of defending the cup. Tobin bronze is a combination of copper with other metals, having a bright, golden color, also being noncorrosive in sea water and remarkable for its high elastic limit, tensile strength, hardness, toughness and uniform texture. These qualities render it highly suitable for marine use, as well as for other purposes requiring strength and resistance to corrosion.

**Financial and Industrial.**—The August number of the *Manual of Statistics Supplement* contains a large amount of information in regard to financial, corporate and stock market affairs. A feature is the latest statistical news from some 75 of the active railroad and industrial corporations of the United States, including facts and figures showing their recent activities. Here are found full details in relation to earnings and revenue accounts of the United States Steel Corporation for the first six months of the current year, a presentation that in the convenient form in which it is arranged is not only useful for the moment, but is also convenient for the future reference of all who may be interested in this great corporation. In similar manner the affairs of other corporations, such as the Baltimore & Ohio Railroad Company, Bay State Gas Company, Knoxville Traction, International Steam Pump Company, United States Cotton Duck Corporation, United States Rubber Company, Virginia & Carolina Chemical Company and other large industrials prominent in the public eye are treated. In connection with these and other corporations reference to the page number of the *Manual of Statistics* for 1903 on which the particular companies appear is appended, thus enabling the reader readily to bring the annual statement of the company into connection with the later statement in this *Supplement*. In addition there are statements in relation to new corporations that have more recently come into existence, such as the American Seeding Machine Company, American Stogie Company, Hudson & Manhattan Railway Company, North American Biscuit Company, Pope Mfg. Company, which is a reorganization of the American Bicycle Company, and others. Full statements are set forth in regard to the incorporation, stock issues, funded debt issues and other points relating to the financial affairs of these companies that are of importance to the investing public. In the quotations department of the *Supplement* the leading stocks and bonds dealt in on the Boston, New York and Philadelphia Exchanges are listed with the highest and lowest figures for them in 1902 and 1903 down to the close of the month of July, and also the highest and lowest quotations for the month just ended. There are also tables in relation to prices, production, visible supply, futures, acreage, crop movement, receipts of stocks and other details of the cotton crop and cotton market, in all of which the figures are brought down to the close of the month of July. The editorials of the current number treat of subjects that are of particular prominence in the financial, speculative and investing community just now. An editorial on the "Congestion of Securities" points out in detail how recent developments have shown that it is the oversupply of new securities, rather than any positive dearth of capital, which has been the chief source of trouble in the financial market, and it is declared that the securities market must face this condition of affairs for some time to come. In an editorial on "Stock Market Failures" an optimistic view is taken of recent disturbances in Wall Street. It is pointed out that there has been no serious disturbance either in the speculative or investing community in consequence of these failures, while at the same time the outcome has demonstrated that Wall Street is not in a bad condition, and the depression of the last few months is practically at an end.

"Noiseless Gearing" is the title of a pamphlet by the New Process Raw Hide Company of Syracuse, N. Y., which describes their raw hide gears. By a special process of their own of curing and treating raw hide and compressing and riveting layers of it together by powerful hydraulic pressure, they produce a solid mass of material of a durability, rigidity and consistency only exceeded by a few of the very hardest metals. From these solid blocks are cut pinions which, working noiselessly in connection with metal gears, accomplish the desired result.

The H. W. Johns-Manville Company of 100 William street, New York, have been pioneers in developing modern fuse protective devices. They are now introducing branch blocks which are compact in size, afford security from accidental cross connection of contacts, are easy of installation and are approved by the underwriters.

"Modern Pumping Machinery" is the title of a well illustrated booklet by the Heisler Pumping Engine Company of Erie, Pa. The pumping engines built by this company are remarkable for their economy and compact design. The 8,000,000 gallon water works engine, pumping against 90 pounds, requires a floor space 6 x 14 feet and is 18 feet high.

We have received from the Mason Regulator Company of Boston a catalogue describing their new automobile steam engine. This engine represents the result of the three-fold experience of making, operating and repairing steam engines. It has no delicate parts or intricate devices, but is extremely simple in construction. The Model C develops approximately 7½ horse power under 200 pounds steam pressure.

## The Equalization of Hot Blast Temperatures for Blast Furnaces.*

BY JOSEPH H. HARRISON.

The importance of regularity, both in materials for the blast furnace and in the operations connected with its working, is being more and more recognized. Irregularity in the chemical or mechanical condition of the materials charged, or in the method of charging them into the furnace, causes irregularity in the working of the furnace and in the quality of the iron produced. Irregularity in the temperature of the hot blast causes the same evils. The hot blast supplies oxygen for the combustion of the coke, and also heat to the furnace which would otherwise have to be provided by the burning of coke. It is clear that if the temperature of the hot blast varies the quantity of the coke at the melting zone should also vary to keep the heat constant; but this is impossible.

Hot blast supplied by the reversing regenerative stoves, now almost universally used, varies between 200 degrees and 300 degrees F., owing to the rapid cooling effect of the cold blast passing through them. The effect of these variations is to alter the position of the melting zone in the furnace. Higher blast temperature causes local combustion, and this, following immediately after a comparatively low temperature of blast and more extended combustion, has the effect of leaving those mate-

* A paper read before the Engineering Conference of the Institution of Civil Engineers of Great Britain.

rials which had been partly fused beyond the new melting zone. In extreme cases the natural mechanical formation and condition of these materials combine to form an arch or dome across the furnace. Parts of this adhere to the walls, forming scaffolds, causing the furnace to hang, and produce iron of low quality and reduced quantity until the scaffold is fused off. This is a serious loss of value of product, and disorganizes the whole plant owing to a deficiency in quantity and quality of gas for the stoves and boilers.

With the old fashioned pipe stoves there is no sudden variation in the temperature of the hot blast, and a "hanging" furnace is rarely known where this type of stove is used together with uniform materials, and a larger proportion of high grade iron is produced.

In America the regular practice is to cool down the hot blast with cold blast to a temperature which the stoves can maintain continuously, in order that the blast temperature shall be uniform, although at the lowest point given by the stoves and requiring continuous regulation of the cold blast admission.

Perfect regularity of hot blast temperature, with practically no loss of heat, can be obtained by interposing in the course of the blast between the stoves and the furnace a mass of fire brick checker work, which takes up heat from the blast when it is above the average temperature and gives heat back to it when its temperature is below the average. This apparatus, known as an "equalizer," is similar in appearance to a small Cowper stove. A brick lined steel shell, with slag wool between the lining and the shell, is filled with fire brick checker work, divided centrally by a wall, thus forming two chambers communicating at the top. The hot blast from the stoves is made to pass up one chamber, down the other, and out at the bottom to the furnace.

The blast from a freshly heated stove is at its highest temperature, and on entering the equalizer first comes in contact with that portion of the checker work which has been to some extent chilled by the blast at its lowest temperature from the stove which has just "gone off" blast. The blast from the freshly heated stove parts with some of its heat to the checker work; but as this stove's run continues the blast it gives gradually falls in temperature below that of the equalizer, and the checker work then returns heat to the blast passing over it. In this way there is a constant exchange of heat between the blast and the checker work, resulting in a perfectly uniform temperature of hot blast passing to the furnace, and at practically the average of that at which it enters the equalizer. The equalizer produces blast of uniform temperature in the same way as a flywheel produces regular speed in an engine. The equalizer has no valves, no attention of any kind is required, and no cleaning has to be done, as gas is not put into it.

One of these equalizers, 20 feet in diameter by 55 feet in hight, was put to work in May, 1901, and gives hot blast of perfectly uniform temperature. The diagrams of autographic records from a Uehling pyrometer show the temperature of the blast as it goes into the equalizer and as it leaves it. This pyrometer is a double instrument, one fire tube being in the inlet to the equalizer and the other in the horseshoe main round the furnace, and the records are made simultaneously. The temperature shown on the equalizer side is about 25 degrees F. below the average of that on the inlet side. This is the actual loss of heat, and is the only loss due to the apparatus.

A second equalizer was put to work on March 31, this year, at another works, and is giving the same regular blast temperature. The average of the temperatures it has shown by the upper record has been compared with that of the lower record, and shows a loss of only 22 degrees F.

A third equalizer is being erected at another works. Hanging has occurred with the furnace, which has worked two years with an equalizer; but in every case this has been directly traced either to the irregular quality of the ore, which is all imported and of very varying character, or to irregular charging of the materials. No such trouble has occurred from irregular temperature of the blast.

# MANUFACTURING.

### Iron and Steel.

When improvements now under way at the steel plant of the Standard Steel Car Company, Butler, Pa., have been completed this concern will have a capacity for turning out nearly 100 steel cars per day. The stockholders of the company recently authorized an increase in the capital stock from $3,000,000 to $5,000,000 and a bond issue of $2,000,000. The main building is now being extended by the addition of a structure 240 x 500 feet. The concern have orders on their books for steel cars which will take up their entire output well up to the close of the year, and they have also received one or two orders for 1904 delivery.

The furnace of the Spring Lake Iron Company, Fruitport, Mich., was blown out recently, after a continuous run of nearly six years. The shutting down was for the purpose of making repairs, which will consist of entire new lining and hearth, new hot blast stove, new hoisting engine, and large storage shed of 160 carloads' capacity for storing charcoal. The work is being pushed as rapidly as possible, and it is expected that repairs will be completed and the furnace in operation again by September 15

The Nebraska & Iowa Steel Tank Company, Omaha, Neb., have rented a building at 2416 Grant street, Omaha, and will at once begin the manufacture of patent steel tanks. The company were organized at Peabody, Kan., and for several weeks the management have been in search of a desirable location for the establishment of their plant. A. N. Eaton is president and manager, and H. N. Brockway, Jr., secretary and treasurer.

The Simplex Railway Appliance Company, Hammond, Ind., are increasing their capacity by the erection of a new steel frame building, 180 x 300 feet. The company are getting ready to manufacture coil and elliptic springs for all kinds of cars and locomotives.

The Crum Lynne Iron & Steel Works, at Crum Lynne, Pa., have resumed operations after having been idle for more than three weeks.

The Central Iron & Steel Company of Harrisburg, Pa., have let to the Pennsylvania Steel Company of Steelton, Pa., the contract for the rebuilding of their No. 2 mill building, destroyed by fire some months ago. This building includes an 89 and a 72 inch steel mill and will be entirely fire proof. The Pennsylvania company have also the contract for the construction of an open hearth department for the Central company, and announced this week that the new plant will be ready for operation January 1, 1904.

Changes are contemplated at the plants of the Eastern Steel Company, at Pottsville, Pa., which will enable the company to manufacture billets for sale to outside firms. The new steel mill is being rapidly completed and President Donovan is bending every effort to have it in operation by December 1. To that end an increased force of men was put to work last week. The soaking pit building will be extended 56 feet, making in all 168 feet, and a third furnace will be erected there. Three new 100-foot stacks will be built at the soaking pits. The new 28-inch mill will not be completed until after the new steel mill is put into operation.

The Hooven rolling mill property, in Norristown, Pa., has been purchased by H. M. Light and S. P. Light of Lebanon. The Norristown Iron Company transferred the property to M. H. Taggert, 3d, of Northumberland, who in turn transferred it to the Lights for $30,000. The buildings will be razed.

The Westmoreland Steel Company of Pittsburgh hrve commissioned James J. Mahon, contracting engineer, Pittsburgh, Pa., to design and install for them at their works at Greensburg, Pa., a modern annealing furnace. It is expected the furnace, although fired direct, will be under such control of the operator that any degree of temperature can be obtained and maintained uniformly, as the proper annealing of the finer grades of tool steel is usually a difficult matter. Charles W. Wright, manager of the plant, is so well pleased with the general design of the new furnace that he anticipates when it is in operation they will be able to supply their customers with material the annealing of which will be beyond criticism. The Westmoreland Steel Company have expended a great deal of money in the past two years in improving their plant and increasing their output, which consists chiefly of hammered and rolled tool steel, forgings, &c.

Hannah furnace of Republic Iron & Steel Company, at Youngstown, Ohio, and one stack of the Andrews & Hitchcock, at Hubbard, Ohio, have resumed blast after being idle for some time for relining and repairs.

Fires were lighted in the new plant of the Cleveland Furnace Company on August 20. The blast at the furnace was to have blown in one week previous, but an accident which caused the death of three men delayed matters until the date mentioned. The repairs necessary because of the accident were completed much sooner than at first thought possible. The accident was caused by the breaking of the rods which supported the bell, allowing it to drop to the bottom of the shaft. New rods were put in place and the bell raised to its position. A week ago there were a large number of prominent furnacemen from all

parts of the country present to witness the firing of the first blast, but they did not remain for the final lighting of the fires. The blast was started with only the local representatives of the company present. At the start the plant will employ 200 men and will work up to nearly full capacity, which is a little over 400 tons per day. At present the ore for the plant is unloaded from vessels at a point near the Central Blast Furnace and then switched to the Cleveland Furnace Company's docks, a distance of about a mile, but with the completion of improvements in the river channel, the vessels will unload directly at the docks of the company.

### General Machinery.

The Pittsburgh Marine & Engineering Company of Pittsburgh have been formed for the unique purpose of conducting a machine and boiler works afloat. The company have a capital of $150,000, and propose to conduct operations on the marine machine boat, which will have a floor space of about 3000 square feet. It will have no rent to pay and will have the advantage of being able to move its plant at will. The officers are: John M. Nuter, president; E. G. Frow, treasurer, and E. B. McCrum, Jr., secretary.

The Morlock Automobile Company, Buffalo, N. Y., are erecting a factory building on Seneca street, that city, and will equip it with up to date machinery.

The Johnston Harvester Company, Batavia, N. Y., are still making extensive improvements to their plant. Ultimately the capacity will be about doubled. The new work includes additional foundry and machine shop buildings and a new power house. When these are completed the plant will give employment to between 1500 and 1700 men.

The Wiard Plow Company, Batavia, N. Y., are making extensive improvements to their plant and adding to their equipment.

The Luitwieler Pumping Engine Company have just been incorporated under the laws of California, with a capital stock of $200,000. The new company will succeed S. W. Luitwieler Company, and will manufacture a line of power pumping machinery for municipal use, hydraulic elevators, mines, deep wells, paper pulp, railroad tank service and automatic fire apparatus, under the Luitwieler patents. It is claimed that the engine is the only nonpulsating, reciprocating pumping mechanism so far perfected. The company have just added to their line of machinery equipment a 40-inch Detrick & Harvey horizontal drilling, boring and milling machine, an open side 36 x 36 inch planer of the same make, besides other smaller machines. The works consist of machine and pattern shops. The product is shipped all over the United States and Mexico. It is intended to locate a large plant in the Middle West to care for the Eastern trade.

The Plunger Elevator Company are occupying the addition to their shops at Barber's Crossing, the new building being 64 x 104 feet and one story high.

The Crompton-Thayer Loom Company, the new Worcester, Mass., concern who will manufacture looms, have decided to take the shop on Cambridge street, next door to the shops of the Prentice Bros. Company and until recently occupied by the carpet loom department of the Crompton & Knowles Loom Works, Worsted, woolen and silk looms of all patterns will be built. The Crompton-Thayer Company are still a firm, but it is understood that they will be incorporated in the near future. It is expected that the shop will be building looms within a month. The members of the firm are E. D. Thayer, Jr., a prominent woolen manufacturer; George Crompton, Randolph Crompton and William B. Scofield, all of Worcester.

The Woburn Machine Company are building a two-story brick factory at Woburn, Mass. T. H. Harriman and D. P. O'Brien are the principals of the company.

The Richards Iron Works, Manitowoc, Wis., have just installed compressed air service in their foundry and machine shop. The new equipment includes chipping hammers, casting rattlers and sand sifters.

The grinder business of L. S. Heald & Son of Barre, Mass., has been incorporated under Massachusetts laws as the Heald Machine Company, with a paid in capital stock of $40,000. The business is being moved to Worcester, Mass., as previously mentioned, and will be located in the shop formerly occupied by the Morgan Motor Company at Barber's Crossing. The officers of the new company are: President, Paul B. Morgan of the Morgan Construction Company, and secretary and treasurer, James N. Heald. The Morgans have taken an interest in the business of the Heald company, which will be continued on extended lines. The grinding machines will be in process of manufacture at Barber's Crossing within a fortnight. The Heald business is a very old one. It was started originally in 1830, at Barre, for the manufacture of carriages and the iron work entering into vehicles. Agricultural machines were the next product of the shops, and then came wire machinery and later shoe machinery, until finally a line of grinders was taken up and developed until the Heald grinder has become one of the best-known machines of the kind on the market to-day.

The Goulds Mfg. Company of Seneca Falls, N. Y., are completing an extensive addition to their works.

The Pacific Iron Works, one of the oldest concerns in Bridgeport, Conn., have been incorporated as the Pacific Iron Works, Incorporated, with a capital stock of $200,000. The business was owned by the late Philo H. Skidmore, and Henry A. Bishop as administrator of the estate holds 1997 shares. The remaining shares are held by H. A. Bishop, Goodwin Stoddard and H. D. Beach, who are the directors of the corporation. The officers are: President and general manager, E. D. Beach; secretary, P. H. Skidmore, and treasurer, Buckingham Marsh. The same general line of foundry, boiler and machine work will be continued, the new management announces, comprising light and heavy iron castings, marine and stationary boilers, and engines and hoisting and mining machinery. The business was started in 1853.

The Sterling Emery Wheel Mfg. Company, Tiffin, Ohio, inform us that the demand for their productions is extremely satisfactory, and in order to take care of their rapidly increasing business they are building quite a large addition to their factory, having just completed a large two-story building 40 x 60 feet and have another one under way 45 x 100 feet, in addition to which three new kilns will also be erected as soon as possible, besides a new foundry and machine shop, for which considerable new machinery will be required.

The Ray Automatic Machine Company, who have removed from Cleveland to Berea, Ohio, which is a short distance from Cleveland, are now operating on a more extensive scale, having added a large number of new machines. Their equipment is now most complete. The location of the new plant is on the Lake Shore, Big Four and Baltimore & Ohio railroads. They claim to be the largest manufacturers of automobile parts in the world and also make automatic nut machines, cold punched nuts and the Vulcan annealing putty. This putty is designed for the use of the blacksmith, tool maker and machinist, annealing all kinds of tool steel perfectly. A steel box is specially made by the company for holding the putty and the steel to be annealed.

The General Automobile & Mfg. Company of Cleveland, Ohio, have failed and have been placed in the hands of L. J. Hammond of the firm of Strong, Carlisle & Hammond, as receiver. The company have been manufacturing gasoline automobiles for about two years, and this year they have shipped about 100 cars. Lack of capital and threatened litigation are the reasons assigned for the failure. The receiver has asked the courts for permission to borrow $10,000 with which to complete into finished product the material now on hand. Some time ago the company purchesed the factory formerly occupied by the O. P. Clay Stampings Company and equipped it with quite a number of machine tools. The receiver was appointed on the application of the H. M. Pattison Supply Company, who furnished machinery and material. It is thought that a new company will be organized to carry on the business, which seemed quite promising.

The City Machine Company of Cleveland are manufacturing a hydraulic jack which promises to be used very extensively by street railway repair shops for removing motors from cars; also for raising cars for repairs. They have recently shipped hydraulic jacks to Cleveland, Detroit, Chicago, Dayton and Newark electric roads.

### Power Plant Equipment.

In remodeling their works at Woodstock, Ill., the Oliver Typewriter Company are adopting electricity for power. They have just placed a contract for a 130-kw. generator and a large number of motors. The introduction of the electric drive has been made to secure economical and rapid manufacture. Ease of distribution, subdivision of departments, independence of operation, cleanliness and economy of space are the motives for adopting electricity in many manufacturing plants. Charles L. Brown of Chicago has been retained as consulting engineer for the installation of the equipment. The generator and motors will be furnished by the Chicago branch of the Crocker-Wheeler Company at Ampere, N. J.

The S. Morgan Smith Company of York, Pa., have under construction three pairs of turbines, each pair of 15,000 horsepower, for the Hudson River Water Power Company of Glens Falls, N. Y. This is one of the largest single contracts ever handled by the company.

The Stewart Boiler Works have just completed a large addition to their works, at Worcester, Mass., which they are now occupying.

Owing to the recent introduction of natural gas throughout the city, Cleveland is presenting an unusually good market for the sale of gas engines for manufacturing purposes. Strong, Carlisle & Hammond of that city, who handle several makes of gas engines, report that they have recently installed in manufacturing plants no less than 12 engines, ranging from 10 to 50 horse-power. In several cases these are used for electric lighting purposes, while in other cases they are used in shops of considerable size. It is claimed that the cost of power is reduced to about one-third the cost of operating boilers and engines.

The Straight Line Engine Company of Syracuse, N. Y., have received orders for two 250 horse-power engines from the Morse Twist Drill & Machine Company of New Bedford, Mass., and two 200 horse-power engines for St. Louis.

The National Malleable Castings Company of Chicago have recently purchased a 300-kw. generator, manufactured by the Crocker-Wheeler Company, for direct connection to a Buckeye

horizontal cross compound engine. This new set will be used to replace four direct connected units of foreign manufacture. The generator will be manufactured at Ampere, N. J., where the works of the Crocker-Wheeler Company are located. This company have already supplied to the Malleable Castings Company about 300 horse-power in motors for factory equipment.

The Harrisburg Foundry & Machine Company, Harrisburg, Pa., are now enjoying the largest business in their history. A list of orders for engines now in course of construction in these works comprises no less than 61. The orders for these engines have been received from all parts of the United States.

**Foundries.**

A stock company are being formed at Platteville, Wis., for the purpose of establishing an iron foundry in that city, and already $12,000 worth of the stock has been subscribed. Those interested in the movement have under consideration the purchase of the Galena Iron Works of Galena, Kan., owned by W. G. Bryant of Carterville, Mo.

The Cambria Foundry & Machine Company of Johnstown, Pa., have elected these directors for the following year: John N. Horn, George A. Hager, Harry M. Benshoff, James H. Geer and N. B. Griffith. A part of the casting department of a new plant at Johnstown is already in operation, and the machine department will be completed in a short time. The new plants will employ about 100 men.

The new addition to the plant of the Buffalo Malleable Iron & Steel Company, on Tonowanda street, that city, has been completed and is in operation. The enlargement and re-equipment of this plant give employment to 350 additional men. The working force in the steel department is to be increased to 1000 men, 850 now being employed.

The West Allis Malleable Iron & Chain Belt Company, West Allis, Wis., as a result of the recent increase in their capital stock from $100,000 to $150,000, will enlarge their capacity by adding 208 feet to the foundry of the plant, doubling the size of the annealing ovens and extending the chain belt department. When the improvements are completed it is expected that the plant will give employment to 200 men. The company have recently commenced making gray iron castings, as well as malleable, and all departments are running to full capacity.

**Bridges and Buildings.**

The Buffalo Expanded Metal Company have secured the contract for fire proofing the factory buildings which the Buffalo Potteries Company are erecting in that city.

The Railway Steel Spring Company, Oswego, N. Y., intend to replace their present wooden building with one of steel and brick construction, to be about 180 x 336 feet, with a separate power house.

The McClintic-Marshall Construction Company of Pittsburgh, with works at Rankin, Pa., and at Pottstown, Pa., have received a contract for the building of three new structural steel frame shops for the Butler Foundry & Machine Company, at North Butler, Pa. The main building will be 100 x 300 feet.

**Fires.**

The factory of the American Roller Bearing Company was destroyed by fire in the Binford street fire, South Boston, August 18. Everything was a total loss. However, the company have for some time been making arrangements for a new plant, with double the capacity of the old one, and even had the fire not occurred they would have been in new and much larger quarters within a short time. In consequence of these plans, already matured, there will be but little delay in handling orders. As the machinery in the Binford street plant was ruined, the company will be in the market for an entirely new equipment of machine tools. The company have opened a temporary office at 43 Lincoln street, Boston.

The shop of F. L. & J. C. Codman, manufacturers of buffing and polishing wheels, at South Boston, was burned out in the recent Binford street fire, in which the American Roller Bearing Company shared a like fate.

The plant of the Montague Iron Works, Montague, Mich., sustained slight damage by fire recently. The fire originated in the pattern storeroom. The loss is fully covered by insurance.

**Hardware.**

W. H. Webb and H. A. Pritchard, Fort Scott, Kan., have started a factory for the making of a patent self heating flat-iron. They report the receipt of more orders than could be filled at once, but expect when established in new quarters to be able to take care of all business promptly.

Both the fencing and fire proofing departments of the International Fence & Fireproofing Company, Columbus, Ohio, show a large increase in business over former years, especially in the fire proofing department, as a number of the largest fire proof structures in this country and Canada at present being erected are using the metallic sheeting and cabling system exclusively as reinforcing numbers for the concrete girders, beams, columns, floors and partition walls.

J. B. Schroder & Co., 133 East Fifth street, Cincinnati, Ohio, are busy on orders for their line of builders' hardware. Among contracts on which they are now engaged are those calling for the builders' hardware on such structures as the First National Bank, Ingalls, Mercantile Library, Warnick, Roanoke, Cincinnati Trust Company, Equitable Bank and Roslyn, of Cincinnati; Dayton Arcade, Rotterman and Davis of Dayton, Ohio; Claypool Hotel of Indianapolis, Ind., &c.

**Miscellaneous.**

The Winton Motor Carriage Company of Cleveland have completed the erection of four large factory additions which were started two months ago, and at present the entire plant is practically closed down for inventory and the rearrangement of machinery. Lately they have purchased a large amount of new machine tool equipment for the new additions, and they will buy more in the near future. They will shortly start work on their 1904 product and their output for next season will be about double what it was this season.

The Federal Mfg. Company of Cleveland are preparing to supply to the automobile trade what constitutes a very remarkable piece of sheet metal stamping work. Heretofore automobile frames have been built up of wood and channel or angle iron. The Federal company devised the plan of stamping the side and end pieces out of sheet metal. The side sections range from 8 to 12 feet in length, and because of the fact that different manufacturers require different lengths and curves in their frames the company were obliged to make the dies in sections, so that by taking out or putting in a section the frame could be shortened or lengthened to suit the purchaser's requirements. The stock used is No. 10 gauge sheet, and a frame of this description is very light yet strong and resilient. There are no brazed joints, the end forgings being made very tight fit and pinned and bolted. To accomplish this work the company were obliged to design one of the largest sheet metal presses ever constructed. It is expected that the new frame will attract considerable attention among automobile manufacturers.

The McKinnon Dash Company, Buffalo, N. Y., are erecting new factory buildings to take the place of the part of their plant destroyed by fire last February. They have been in the meantime using temporary buildings for this part of their work. A great deal of the machinery in the leather working department, which was the part of the factory destroyed, has to be built in their own works, and they are busy building that machinery now. They have placed in their machine shop a number of new lathes, planers, milling machines, &c., but will not buy much additional, as the iron working department, where they use a considerable amount of standard machinery, was not destroyed by the fire.

The Allentown Bobbin Company of Allentown, Pa., will shortly begin the erection of a new factory building, 36 x 120 feet, of brick, two stories high, which will have double the capacity of the present structure. A machine shop, 30 x 36 feet, will also be erected. Jacob Barnes of Allentown is secretary and manager.

Goodling & Snyder of Richmond, Va., will open a factory at York, Pa., on September 1 for the manufacture of patterns for machinery. A large building has been leased for the purpose. The firm are composed of George H. Goodling and William H. Snyder, who for years have been connected with the Richmond Mfg. Company of Richmond, Va.

The Southwestern Pump Company, Wichita, Kan., recently organized with a capital stock of $25,000, have purchased the plant of the Breckenridge Pump Company, which they expect to have in operation about September 1. No new machinery is required. R. O. Rudolf is general manager.

The Zircon Mfg. Company of Detroit, Mich., have decided to locate their business at North Tonawanda, N. Y., and have let contracts for the construction of a three-story brick factory, 35 x 100 feet, to be erected at once. The company will manufacture polishing material, belt dressing and composites from zirconite ores, to be shipped from their mine in the Black Hills, S. D. Fifty men will be employed at the outset. The Detroit plant will be abandoned as soon as the new one is ready for use, which will be in about six weeks.

The Baynes Carriage Company of Buffalo, N. Y., have been incorporated, with a capital stock of $100,000, and have purchased and taken possession of the Niagara street plant of the Buffalo Spring & Gear Company, who are going through bankruptcy proceedings. The directors of the new company are James B. Baynes, A. J. Duerr, L. B. Beale, H. S. Scatcherd and Albert E. Jones, all of Buffalo.

Work has begun on the shops of the new T. H. Buckley Mfg. Company at Worcester, Mass.

At a meeting of the stockholders in Johnstown, Pa., a resolution was adopted dissolving the Cochran Company, a concern that for some years have been manufacturing refrigerating machines at Lorain, Ohio. The company's charter will be surrendered as soon as an order of the court granting the same can be secured. The concern have not been doing a profitable business, it is understood, for some time.

The Morgart Coal & Coke Company have organized at Cumberland, Md. They own a large coal acreage in Barbour County, W. Va., which will be developed.

The Mansfield Engineering Company of Mansfield, Ohio, have been awarded a contract by the Government for the construction

of five gun carriages of the disappearing type, for use on coast fortifications. Without the guns they will weigh 45.000 pounds each, and the contract amounts to $60,000. The company will increase their force to take care of the work.

The expected sale of the business of the Elm City Brass Company of New Haven, Conn., to the Housatonic Mfg. Company has not been consummated, and the Elm City Company have taken new quarters at 28 Artisan street, New Haven. The company manufacture andirons and other fire place implements.

The Harrison Dust Guard Company of Toledo, Ohio, who manufacture dust guards for journals on railway cars, have decided to erect a new factory. Several sites in Toledo are under consideration, and the matter will be decided within a few days. The company are also planning to go into the manufacture of other articles.

The Shade Fixture Company of Shelby, Ohio, have been incorporated, with $10,000 capital stock, by Henry Wentz, W. W. Skiles, G. M. Skiles, W. N. Packer and J. C. Fish. They will manufacture a patented window shade and curtain holder. A location has been secured for a factory.

The New Process Stove Company of Mansfield, Ohio, have been formed by Berry Baxter, E. C. Baxter and others. They have purchased the equipment formerly used by the Monarch Stove Company at Mansfield, and will lease the buildings formerly used by that company. They will manufacture a line of gas heating and gas cooking stoves designed especially for using natural gas.

Henry A. Hawgood of Cleveland has placed a contract with the American Shipbuilding Company of Cleveland for a steel steamer having a capacity of 7600 tons of coal. This makes the second steamer that has been placed for next season's delivery by the American Shipbuilding Company, the other having been contracted for a short time ago by William A. and Arthur Hawgood. The new vessel will be one of the largest on the great lakes, and will be a duplicate of the one now building for Mr. Hawgood by the American Shipbuilding Company.

The Sidewalk Elevator Company of Scranton, Pa., have been incorporated, to manufacture sidewalk elevators, with a capital stock of $5000 and these directors: John Benore, G. B. Carson, J. L. Hoffman, Victor Koch and Fritz Holznagle.

The Kramer Web Company of Philadelphia, Pa., have been chartered to sell printing presses. The capital is $100,000 and the directors J. M. Gazzam, Morris Liveright, S. R. Kramer, J. K. Liveright and E. F. Lukens.

The Shinn Slag Sand Company have been chartered for the manufacture of sand from blast furnace slag, brick and building blocks, with headquarters in Pittsburgh, Pa. The capital is $20,000 and the directors J. A. Shinn, F. Z. Shellenberg, E. W. Shinn, M. Mawlinney, H. R. Myers.

The Reading Gas Fixture Works of Reading, Pa., have been chartered for the manufacture of gas and electrical fixtures, with a capital of $15,000 and these directors: A. N. Kissinger, H. M. Cohen, C. N. Kissinger, N. Dennebaum, H. F. Kantner, Gustave Bromund.

The Mifflinburg Buggy Company of Mifflinburg have been incorporated to manfacture vehicles, and the capital stock is $30,000 and the directors H. F. Blair, R. S. Gutelius, H. B. Young, D. L. Glover, H. P. Glover, W. B. Sterling.

The Wheeling Stove & Range Company, Wheeling, W. Va., are looking for a new site for their plant. The present capacity of the factory has been found to be entirely too small, and the new plant to be erected will be twice as large as the present one. Several sites in the Wheeling districts and at other places are under consideration.

To further facilitate the prompt filling of orders, the Sawyer-Man Electric Company have recently established a distribution depot at the central stores of the terminal warehouse, in West Twenty-eighth street, New York. Here are kept over a million lamps in stock, so that all calls may be speedily and completely answered. A similar depot is situated at Thirtieth and Market streets, Philadelphia, and others in Boston, Buffalo, Syracuse, Pittsburgh, Charlotte, Chicago, Denver, St. Louis, Atlanta, New Orleans, San Francisco, Seattle and other centers of trade.

The Shaw Engineering & Mfg. Company of Newark, N. J., were recently incorporated in New Jersey. The company produce adjustable lifting jacks and an electrical specialty in the form of a lightning arrester. John C. Blevney, who for a number of years has manufactured friction clutches, is president and H. M. Shaw is secretary and treasurer.

The Buffalo Natural Gas Fuel Company are laying about 65 miles of 12-inch wrought iron pipe to connect their gas fields in McLean County, Pa., with Buffalo. The company are planning to expend about $3,000,000 in acquiring new gas properties, in drilling same and in piping.

Contracts for constructing the substructure and superstructure of the subway in Clinton street, Buffalo, N. Y., under the West Shore and Buffalo Creek railroads, have been awarded to E. C. Rumrill, Buffalo, and the Russell Wheel & Foundry Company, Detroit, at $35,163 for the masonry and $30,850 for the iron and steel work, respectively.

The Buffalo Fertilizer Company, capitalized at $200,000, have been incorporated at Buffalo, N. Y., and will erect and equip rendering and fertilizer works.

The American Asbestos & Fireproofing Mfg. Company of Lewiston, Niagara County, N. Y., have been incorporated by Buffalo people, with a capital stock of $500,000. They will at once erect a factory at Lewiston, the head of navigation on the lower Niagara River, and equip it with the latest machinery for the treatment of asbestos ores, heaters, blowers, &c., asbestos board, fire proof wall plaster and various by-products of asbestos will be manufactured. The company's asbestos ore deposits are in the town of Kalabar, County of Lenox, Abbington, Ontario, in the Bay of Quinte district, from which point they can be shipped to the factory by either rail or water. The directors are Richard B. Lyman, E. E. Hedley, C. H. Swager, Herbert P. Bissell and George A. Ricker, all of Buffalo, the last named being secretary and treasurer.

The Dobbie Foundry & Machine Company of Niagara Falls, N. Y., last week shipped a carload of derrick fittings to Manila, Philippine Islands, to be used in the work of improving the harbor there.

The James H. Watson Estate, manufacturers of galvanized eaves trough, conductor pipe and a general line of galvanized iron work, with main office and works at Crawfordsville, Ind., have established a distributing branch office at Ottumwa, Iowa. The Ottumwa branch will supply the Mississippi Valley trade and will be in charge of F. D. Barnhill, who was heretofore associated with the factory at Crawfordsville. The warehouse in the Zulauf Building, at the foot of Jefferson street and on the Rock Island tracks, is already well filled with material ready for delivery, and from $30,000 to $40,000 worth of goods will be continually carried in stock at this newly established branch.

The T. H. Buckley Car Mfg. Company is the name of a new Worcester, Mass., concern, who are to manufacture cars of all description. The company have been incorporated under Maine laws, with a capital stock of $250,000 and with these officers: President and treasurer, Thomas H. Buckley of Worcester; secretary, John P. Flannagan of Worcester; directors, these officers, and Mark N. Skerrett of Worcester, John D. Dean of Ogdensburg, N. Y., and Charles A. Legg of Worcester. Work on the company's plant at Worcester has begun, and the promise is that the company will be doing business in November, as the building operations are rushing.

The Pittsburgh Railway Supply Company, Park Building, Pittsburgh, have not yet decided on a location for their plant, but have received a number of offers of free sites and bonuses from different places. They propose to erect a plant for the manufacture of anti-friction journals and railway supplies.

The Angell Mfg. Company of Franklin, Pa., have applied for a charter, and will erect a plant in Franklin for the manufacture of oil well supplies and specialties in brass and steel. It is expected to have the new plant in operation by October 15 next.

The Jamison Coal & Coke Company, with offices in the Frick Building, in Pittsburgh, will let a contract shortly for 500 steel hopper type coal cars. The order will probably go to the Standard Steel Car Company of Pittsburgh, whose works are at Butler, Pa.

The Plunger Elevator Company of Worcester, Mass., have the elevator contracts for the Oliver Building, at the corner of Oliver and Milk streets, Boston. There will be five passenger elevators, with 125 feet lift. The company also have the contract for three 100-foot run passenger elevators for the department store of J. N. Adams & Co., Buffalo, N. Y.

The Worcester Instantaneous Water Heater Company have been incorporated under Massachusetts laws, with a capital stock of $50,000, to manufacture a water heater and gas stove combined, the invention of Charles C. Malton of Worcester, Mass. The officers are: President, Charles C. Malton; treasurer, George H. Taylor of Boston; directors, these officers, and Wilson Downes of Boston. The company have the Massachusetts rights to the heater and will assemble them at a Worcester shop, the various parts being manufactured by outside concerns.

A report recently published in daily papers to the effect that the Flickinger Wheel Works of Galion, Ohio, had been purchased by the Woolsey Wheel Company of Sandusky, Ohio, and that the equipment of the former would be removed to Sandusky, is emphatically denied by officials of both companies. It is claimed that no such deal has ever been considered, and that the Flickinger plant is not for sale. Considerable new machinery was recently installed by the Woolsey Wheel Company, but no further improvements are contemplated.

**Sixty-Inch Cast Iron Pipe.**—The first 60-inch diameter cast iron pipe was cast at the Scottdale plant of the United States Cast Iron Pipe Company during the past week, and while the largest size ever cast, the results are said to have been entirely satisfactory. The pipe is the first made in fulfillment of a contract for Philadelphia. Seven tons of metal are required for each section, and several miles of pipe are to be furnished on the contract.

# The Iron and Metal Trades.

Attention centers on the Foundry Pig Iron trade. The deadlock which so long continued to mark the relations of makers and consumers has been pretty effectually broken. It has been broken by the makers coming to the terms of the consumers, but that was only to be expected in view of the unfavorable conditions prevailing this summer. The buying movement has taken in a wider range than was noted last week. The activity then reported in Chicago has continued, numerous consumers having covered their requirements for moderate periods, while the Cincinnati market has shown increased activity. A great deal of business has likewise been booked in other markets of the country, and the Eastern districts show such an improvement that local furnace interests are now disposed to take a position of greater firmness in naming prices. It appears that the prices now ruling in the South, as well as in other producing sections of the country, have so closely approximated the prevailing cost of production that a number of makers are confronted by the necessity of doing one of two things, either asking higher prices or blowing out their furnaces.

We have now seen a continuous decline in prices for over three months, and it seems quite natural to expect something of a reaction. Consumers have been deferring their purchases as long as they possibly could, and the events of the past two weeks show that the time has at last been reached when they feel that they are getting close to bottom. It would therefore appear, taking all circumstances into consideration, that the Pig Iron market has, temporarily at least, reached a substantial basis which affords good ground for encouragement.

The demand for finished products shows no special feature. Tubes, Tin Plates and Wire are fully as active as in recent weeks. Sheets are in a little better demand, but prices are inclined to recede still further. A careful canvass of the structural trade by the leading interest shows as large a tonnage in sight as last year at this time, and, barring unexpected calamities, a very heavy business is anticipated in this line for the coming twelve months.

Coke is growing more plentiful, and unless the railroad situation becomes very bad the blast furnaces this fall and winter will be favored with cheap and abundant fuel. As usual, very high prices have stimulated the production until it is in excess of the demand.

Trade in Old Material continues extremely dull. The decline in prices in this line has caused a failure among the local dealers.

## A Comparison of Prices.

**Advances Over the Previous Month in Heavy Type, Declines in Italics.**

At date, one week, one month and one year previous.

| | Aug.26, 1903. | Aug.19, 1903. | July29, 1903. | Aug. 27, 1902. |
|---|---|---|---|---|
| **PIG IRON:** | | | | |
| Foundry Pig No. 2, Standard, Philadelphia | *$16.75* | $16.75 | $17.75 | $22.00 |
| Foundry Pig No. 2, Southern, Cincinnati | *15.00* | 15.25 | 15.25 | 20.25 |
| Foundry Pig No. 2, Local, Chicago | *16.50* | 16.50 | 17.25 | 22.00 |
| Bessemer Pig, Pittsburgh | *17.85* | 17.85 | 18.85 | 21.75 |
| Gray Forge, Pittsburgh | *16.00* | 16.00 | 16.50 | 20.75 |
| Lake Superior Charcoal, Chicago | *19.00* | 21.00 | 21.50 | 26.00 |
| **BILLETS, RAILS, &c.:** | | | | |
| Steel Billets, Pittsburgh | 27.00 | 27.00 | 27.00 | 31.00 |
| Steel Billets, Philadelphia | *28.00* | 28.00 | 28.25 | 28.00 |
| Steel Billets, Chicago | 28.00 | 28.00 | 28.00 | 29.60 |
| Wire Rods, Pittsburgh | *35.00* | 35.00 | 35.50 | 36.00 |
| Steel Rails, Heavy, Eastern Mill | 28.00 | 28.00 | 28.00 | 28.00 |
| **OLD MATERIAL:** | | | | |
| O. Steel Rails, Chicago | *16.50* | 16.50 | 17.00 | 18.50 |
| O. Steel Rails, Philadelphia | *16.75* | 17.75 | 18.75 | 21.50 |
| O. Iron Rails, Chicago | *18.50* | 18.50 | 18.50 | 24.50 |
| O. Iron Rails, Philadelphia | *19.00* | 21.00 | 20.50 | 24.00 |
| O. Car Wheels, Chicago | *21.00* | 21.50 | 21.50 | 21.00 |
| O. Car Wheels, Philadelphia | *19.00* | 19.00 | 20.50 | 20.00 |
| Heavy Steel Scrap, Pittsburgh | *17.00* | 19.00 | 19.00 | .... |
| Heavy Steel Scrap, Chicago | *14.50* | 15.00 | 15.50 | 18.00 |
| **FINISHED IRON AND STEEL:** | | | | |
| Refined Iron Bars, Philadelphia | *1.60* | 1.60 | 1.65 | 1.92 |
| Common Iron Bars, Chicago | *1.55* | 1.60 | 1.65 | 1.80 |
| Common Iron Bars, Pittsburgh | *1.60* | 1.60 | 1.65 | 1.80 |
| Steel Bars, Tidewater | 1.70 | 1.70 | 1.70 | 2.00 |
| Steel Bars, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.60 |
| Tank Plates, Tidewater | 1.78 | 1.78 | 1.78 | 2.00 |
| Tank Plates, Pittsburgh | 1.60 | 1.60 | 1.60 | 1.75 |
| Beams, Tidewater | 1.73½ | 1.73½ | 1.73½ | 2.25 |
| Beams, Pittsburgh | 1.60 | 1.60 | 1.60 | 2.00 |
| Angles, Tidewater | 1.73½ | 1.73½ | 1.73½ | 2.25 |
| Angles, Pittsburgh | 1.60 | 1.60 | 1.60 | 2.00 |
| Skelp, Grooved Iron, Pittsburgh | *1.80* | 1.82½ | 1.85 | 2.12½ |
| Skelp, Sheared Iron, Pittsburgh | *1.85* | 1.87½ | 1.90 | 2.15 |
| Sheets, No. 27, Pittsburgh | 2.60 | 2.60 | 2.60 | 2.90 |
| Barb Wire, f.o.b. Pittsburgh | 2.60 | 2.60 | 2.60 | 2.90 |
| Wire Nails, f.o.b. Pittsburgh | 2.00 | 2.00 | 2.00 | 2.05 |
| Cut Nails, f.o.b. Pittsburgh | 2.15 | 2.15 | 2.15 | 2.05 |
| **METALS:** | | | | |
| Copper, New York | **13.75** | 13.62½ | 13.00 | 11.50 |
| Spelter, St. Louis | **5.60** | 5.50 | 5.50 | 5.20 |
| Lead, New York | 4.12½ | 4.12½ | 4.12½ | 4.10 |
| Lead, St. Louis | *4.15* | 4.10 | 4.20 | 3.97½ |
| Tin, New York | *27.70* | 27.80 | 28.60 | 27.80 |
| Antimony, Hallett New York | *6.37½* | 6.37½ | 6.50 | 8.00 |
| Nickel, New York | 40.00 | 40.00 | 40.00 | 40.00 |
| Tin Plate, Domestic, Bessemer, 100 pounds, New York | 3.99 | 3.99 | 3.99 | 4.19 |

## Chicago.

FISHER BUILDING, August 26, 1903.—(*By Telegraph.*

The Pig Iron market has continued quite active, although the volume of business has been smaller than for several weeks. Several large buyers are still in the market, but seem indisposed to close except at further concessions. The bulk of the business during the past week has been made up of relatively small amounts from small consumers covering requirements for the last half of the year, but several lots running over 1000 tons each have also been placed. Bar Iron has been quiet and has sustained a further decline. The most important feature of the Steel market is the outlook for Structural Steel. Competent authorities have made an estimate during the past week of the work which it is possible may be placed for 1904 delivery, if labor and financial conditions are favorable. Based upon returns made by architects and engineers, it is estimated that the Steel mills may secure from this section alone 300,000 tons of Structural Shapes for 1904 delivery, 175,000 tons of which is for general building and 125,000 tons for railway and highway construction. For the moment, however, business is confined to a moderate tonnage, mainly for renewals by railways and moderate contracts for office buildings. There has been moderate buying of Steel Rails for early shipment, and increased buying of Tire and Spring Steel and agricultural specialties for the 1903-1904 season. Merchant Pipe, too, has continued active, but Billets and Plates have continued dull, while Sheets have been slow, with liberal concessions granted on Black. Cast Iron Pipe has shown some slight improvement. Coke has remained steady, the feature being the difficulty in making shipments promptly, although there is plenty of Coke at the ovens. Old Ma-

terial has developed a weaker tone and lower prices have ruled.

**Pig Iron.**—Very few, if any, really large transactions have been consummated during the past week, but there has continued to be a fair run of small orders, ranging up to 1000-ton lots, which in the aggregate is considerable—probably 25,000 to 30,000 tons all told. The activity, too, has largely been in Southern Iron, the relatively higher prices being asked for Northern Iron checking purchases to some extent. On the other hand, the lower prices prevailing for Southern Iron have not stimulated buying, except in small quantities, the largest consumers, reporting still lower prices, being disposed to wait for further concessions. The general impression, however, is that with the selling price close to cost, leaving only a narrow margin of profit for producers, there will not be much decline from the present market level. The fact, too, that the most aggressive independent furnaces are now well sold up to January of next year makes it probable that the association furnaces will be better able to maintain their present schedule. The associated furnaces, however, are much in need of business, and a few independent furnaces have contracted to take orders at from 25c. to 50c. per ton under the official market, the most important transaction of the week being for about 4000 tons of No. 2 Southern Foundry, sold to the American Seeding Machine Company, on the basis of $11.50, Birmingham, for delivery at Springfield, Ohio; and several lots of a few hundred tons each of No. 3 have been sold at $11, Birmingham. And to meet this competition it is reported that even associated furnaces have shaded the official price 25c. per ton. The agricultural implement manufacturers are still in the market for 25,000 tons of Southern Iron, and may close at any moment. Pipe shops and radiator manufacturers are also buying, but only to a moderate extent and mainly for early delivery. Large machinery interests are also figuring upon placing orders for a considerable quantity for the last half of the year delivery. There has continued to be a good inquiry for Malleable Iron, but the market has continued to recede; and while the lots of 3000 to 5000 tons, referred to a week ago, are reported to have sold at $17.50, the market at the close is easier and it would be difficult to sell large quantities at over $17, Chicago. Sales which were made two weeks ago are now coming to the surface, one lot being of 4000 tons at $17.50, delivered at Michigan City. One thousand to 2000 tons of Bessemer have been sold during the week on the basis of $17, Chicago. A few single cars and 100-ton lots of No. 2 Northern Foundry have been sold at $16.50, Chicago, but other furnaces are demanding 50c. to $1 per ton over these prices. The fact that several Northern stacks have blown out for repairs strengthens the Northern position, and in not a few instances Malleable Iron is being placed on foundry contracts. Lake Superior Charcoal Iron has developed an easier tone, and prices have yielded somewhat because of decreased demand and accumulated stocks; among the sales have been 1000 tons at $20, delivered Chicago. There has been a moderate demand for High Silicon Iron, and some moderate sales of Southern Charcoal brands on the basis of inside quotations. Forge Iron has been more freely offered, it being claimed that Southern Gray Forge is available at $14, Chicago, which is considerably under the relative prices prevailing for Foundry grades. Some consumers have allowed stocks to decline heavily, and hence the need for quick shipment continues active. Most of those placing contracts for the last half of the year are asking for early deliveries of a small proportion. The following are the approximate prices current, f.o.b. cars, Chicago, for delivery any time during the remainder of the year:

| | |
|---|---|
| Lake Superior Charcoal | $19.00 to $20.00 |
| Northern Coke Foundry, No. 1 | 17.00 to 17.50 |
| Northern Coke Foundry, No. 2 | 16.50 to 17.00 |
| Northern Coke Foundry, No. 3 | 16.00 to 16.50 |
| Local Scotch, No. 1 | 18.00 to 18.50 |
| Ohio Strong Softeners, No. 1 | 18.00 to 18.50 |
| Ohio Strong Softeners, No. 2 | 17.50 to 18.00 |
| Southern Silvery, according to Silicon | 18.10 to 19.00 |
| Southern Coke, No. 1 | 16.35 to 16.85 |
| Southern Coke, No. 2 | 15.85 to 16.35 |
| Southern Coke, No. 3 | 15.35 to 15.85 |
| Southern Coke, No. 1 Soft | 16.35 to 16.85 |
| Southern Coke, No 2 Soft | 15.85 to 16.35 |
| Foundry Forge | 14.85 to 15.35 |
| Southern Gray Forge | 14.35 to 14.85 |
| Southern Mottled | 13.85 to 14.35 |
| Southern Charcoal Softeners, according to Silicon | 19.30 to 21.30 |
| Alabama and Georgia Car Wheel | 25.35 to 27.35 |
| Malleable Bessemer | 17.00 to 17.50 |
| Standard Bessemer | 17.50 to 18.00 |
| Jackson County and Kentucky Silvery, 6 to 10 per cent. Silicon | 20.30 to 22.30 |

**Bars.**—Some little increase in business has been experienced in Soft Steel Bars during the week, between 3000 and 4000 tons having been placed for delivery during the 1903-1904 season, but as a rule the market continues quiet, although the mills are still busy in filling specifications on old contracts. Bar Iron has been more freely offered and lower prices have been accepted, some lots of a few hundred tons each having been placed at 1.55c., Chicago, but the bulk of the business has been at 1.60c., Chicago. Official prices of Steel have remained unchanged. With the exception of Bar Iron, the following are the official prices, f.o.b. cars, Chicago, mill shipment: Bar Iron, 1.55c. to 1.60c.; Soft Steel Bars, 1.76½c. to 1.86½c.; Hoops, 2.06½c. to 2.16½c.; Bessemer Bands, 1.76½c. to 1.86½c.; Angles, under 3 inches, 1.86½c. to 1.91½c., base. There has been a moderate merchant trade and the market has been without further change, Iron Bars selling at 1.90c. in carload lots and 2c. to 2.15c. in less than carload lots; Soft Steel Bars, 2c. rates; Angles, under 3 inches, 2.10c. rates, and Hoops, 2.40c., base, from store.

**Structural Material.**—While the new tonnage placed during the last week has been relatively light, and there is not much prospect of increased business in the near future, the fact remains that there is a large tonnage which will be placed for 1904 delivery if conditions develop favorably within the next few months. Railroad work, aggregating about 5000 tons, will be placed within the next few days, the Northern Pacific, the Burlington, the Northwestern and the Chicago, Milwaukee & St. Paul railroads, all being on the eve of placing contracts for renewals of bridges. There has also been a moderate amount of Structural Material for local and nearby buildings considered. The mills can make reasonably prompt shipments on nearly all sizes and the market remains unchanged as previously quoted, as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. There has been but little if any increase in the demand for shipment from local stocks and prices have been without further change, sales being made as follows: Beams and Channels, 2.10c. to 2.25c.; Angles, 2.10c. to 2.25c.; Tees, 2.15c. to 2.30c., from local yards.

**Plates.**—There has been some little new business and moderate specifications on old contracts, the market remaining steady as previously quoted, official prices being as follows, f.o.b. cars, Chicago: Tank Steel, ¼ inch and heavier, 1.75c. to 2c.; Flange, 1.85c. to 2.15c.; Marine, 1.95c. to 2.10c. Local Stocks are quite liberal and with only a moderate demand and increased competition from outside points prices have been reduced, as follows: Steel, ¼ inch and heavier, 2c. to 2.15c.; Tank Steel, 3-16 inch, 2.10c. to 2.25c.; No. 8, 2.15c. to 2.30c.; No. 10, 2.30c. to 2.40c.; Flange Steel, 2.25c. to 2.40c., all f.o.b. warehouse, Chicago.

**Sheets.**—While there has been no change in official prices the market has been weaker and actual transactions are said to have been made at from $1 to $2 per ton under the schedule. The following are the official prices asked, f.o.b. cars, Chicago, mill shipment: No. 10, 2.06½c. to 2.16½c.; No. 12, 2.16½c. to 2.26½c.; No. 14, 2.26½c. to 2.36½c.; No. 16, 2.36½c. to 2.46½c.; Nos. 18 and 20, 2.50½c. to 2.60½c.; Nos. 22 and 24, 2.60½c. to 2.70½c.; No. 26, 2.70½c. to 2.80½c.; No. 27, 2.80½c. to 2.90½c.; No. 28, 2.90½c. to 3.00½c. Small lots for shipment from local stocks are sold at from 10c. to 15c. over mill prices. Galvanized Sheets have been in better demand and steady at 75, 10 and 2½ to 75, 10 and 5 discount, mill shipment, while small lots from local stocks are selling at 75 and 2½ to 75 and 5 discount.

**Cast Iron Pipe.**—There has been an improved demand for moderate amounts of small sizes from water and gas companies, but few, if any, contracts offering by city governments. It is expected, however, that Colorado Springs, Col., will soon be in the market for either Steel or Cast Iron Pipe. For current mail orders received quotations are as follows: 4-inch, $31; 6 and 8 inch, $30; larger sizes, $29, in carload lots, for Water, and $1 per ton higher for Gas Pipe.

**Billets.**—The market is extremely dull, there being little demand even for jobbing lots. The official price for Bessemer Billets remains unchanged at $28, f.o.b. cars, Chicago, and $1 per ton higher for Open Hearth. Small lots of Open Hearth Forging Billets sell at from $32 to $38, according to analysis, buyer and time of delivery.

**Merchant Pipe.**—Activity in this line has continued, the demand being for all sizes, jobbers continuing to place important orders for fall requirements. The schedule of discounts is unchanged, as follows, in carload lots, Chicago, base, random lengths, mill shipment:

| | Steel Pipe. | | Guaranteed Wrought Iron | |
|---|---|---|---|---|
| | Black. | Galvd. | Black. | Galvd. |
| | Per cent. | Per cent. | Per cent. | Per cent. |
| ⅛ to ⅜ inch | 66.35 | 56.35 | 63.35 | 53.35 |
| ½ inch | 68.35 | 58.35 | 65.35 | 55.35 |
| ¾ to 6 inches | 73.35 | 63.35 | 70.35 | 60.35 |
| 7 to 12 inches | 67.35 | 57.35 | 64.35 | 54.35 |

Less than carloads, 12½ per cent. advance.

**Boiler Tubes.**—With moderate activity the market has continued firm, manufacturers continuing to receive a fair number of contracts at the previous schedule of discounts for mill shipment, which are as follows:

| | Steel. | Iron. |
|---|---|---|
| 1 to 1½ inches | 40 | 35 |
| 1¾ to 2½ inches | 55.85 | 35.85 |
| 2¾ to 5 inches | 60.85 | 45.85 |
| 6 inches and larger | 55.85 | 35.85 |

Less than carloads, 12½ per cent. advance.

There has been a moderate distributive demand from local stocks, and prices have been better maintained than heretofore. The following is the schedule of discounts for shipment from local warehouses:

| | Steel. | Iron. |
|---|---|---|
| 1 to 1½ inches | 40 | 35 |
| 1¾ to 2½ inches | 50 | 32½ |
| 2¾ to 5 inches | 57½ | 42½ |
| 6 inches and larger | 50 | .. |

**Merchant Steel.**—A larger volume of business has been transacted during the week, sales aggregating 3000 or 4000 tons for shipment during the 1903-1904 season. Both agricultural implement and carriage manufacturers have been in the market, the latter for Spring and Tire Steel. Agricultural makers have placed orders for a number of specialties, as well as Standard Steel. Prices have remained unchanged, the official quotations being as follows for mill shipment: Smooth Finished Machinery Steel, 2.01½c. to 2.11½c.; Smooth Finished Tire, 1.96½c. to 2.11½c.; Open Hearth Spring Steel, 2.66½c. to 2.76½c.; Toe Calk, 2.31½c. to 2.46½c.; Sleigh Shoe, 1.86½c. to 1.96½c.; Cutter Shoe, 2.41½c. to 2.61½c. Ordinary grades of Crucible Tool Steel are quoted at 6c. to 8c. for mill shipment; Specials, 12c. upward. Cold Rolled Shafting in carload lots sells at 47 and in less than carload lots at 42 discount from list.

**Rails and Track Supplies.**—There has been a fair demand for both Standard and Light Rails for early shipment, sales of Standard aggregating about 3000 or 4000 tons and Light Rails 1000 to 2000 tons during the last week. There has been but little inquiry for 1904 delivery, but the market has continued firm, official prices being $28 for Standard and $27 for second quality, mill shipment. Light Rails have sold at $34 to $38. Track Supplies have been in good demand and the market has remained firm, as follows: Splice or Angle Bars, 2c. to 2.10c.; Spikes, 2.10c. to 2.15c.; Track Bolts, 3½ to 3¾ inches and larger, with Square Nuts, 2.85c. to 2.90c.; with Hexagon Nuts, 3c. to 3.10c. From store 10c. to 15c. over mill prices are asked and obtained.

**Old Material.**—While there has been an improved demand from both rolling mills and Open Hearth furnaces the offerings have been liberal, especially from railroads, and with Pig Iron still weak, Scrap has been slow and easy, with lower prices ruling for Heavy Steel Melting Scrap, Mixed Steel, Dealers' Forge, Borings, Heavy Cast Scrap, while Turnings and Stove Plate have been a little stronger and a little higher prices have been obtained. There is a good demand for Heavy Relaying Rails, which are in moderate supply, but Old Car Wheels are easier. The following are the prices current per gross ton, f.o.b. cars, Chicago:

| | |
|---|---|
| Old Iron Rails | $18.50 to $19.00 |
| Old Steel Rails, mixed lengths | 16.50 to 17.00 |
| Old Steel Rails, long lengths | 19.00 to 19.50 |
| Heavy Relaying Rails | 28.00 to 29.00 |
| Old Car Wheels | 21.00 to 21.50 |
| Heavy Melting Steel Scrap | 14.50 to 15.00 |
| Mixed Steel | 12.50 to 13.50 |

The following quotations are per net ton:

| | |
|---|---|
| Iron Fish Plates | $15.50 to $16.00 |
| Iron Car Axles | 19.50 to 20.00 |
| Steel Car Axles | 17.50 to 18.00 |
| No. 1 Railroad Wrought | 14.00 to 14.50 |
| No. 2 Railroad Wrought | 13.50 to 13.75 |
| Shafting | 16.00 to 16.50 |
| No. 1 Dealers' Forge | 12.50 to 13.00 |
| No. 1 Busheling and Wrought Pipe | 11.00 to 11.50 |
| Iron Axle Turnings | 11.00 to 11.50 |
| Soft Steel Axle Turnings | 11.00 to 11.50 |
| Machine Shop Turnings | 10.00 to 11.00 |
| Cast Borings | 5.75 to 6.25 |
| Mixed Borings, &c | 5.75 to 6.25 |
| No. 1 Boilers, cut | .... to 13.00 |
| Heavy Cast Scrap | 13.50 to 14.00 |
| Stove Plate and Light Cast Scrap | 10.50 to 11.50 |
| Railroad Malleable | 14.00 to 14.50 |
| Agricultural Malleable | 13.00 to 13.50 |

**Metals.**—The stronger tone developed in Copper early in the week was responsible for an increased demand, but during the past few days the market has weakened and the demand has fallen off materially, the close being quiet, Casting Copper being held at 13c. and Lake at 13⅜c., in carload lots. Spelter has been in more active demand and stronger, it being almost impossible to place orders for prompt shipment, but sales for September have been made at 5.55c. and for October at 5.60c. Sheet Zinc has remained firm, at 6¾c. Pig Tin is selling in a small way at 30c. Lead has been quiet, but firm, at 4.05c. in 50-ton lots and 4.07½c. in carload lots. Old Metals have been stronger in tone and a little more active, and higher prices obtained. Heavy Cut Copper is selling at 11¾c.; Red Brass, 11⅛c.; Copper Bottoms, 10⅝c.; Lead Pipe, 3.80c., and Zinc at 4.65c., spot.

**Coke.**—While the supply of Coke is liberal and the ovens are anxious to make shipments, they are hampered by inadequate car supply. There has continued to be a moderate demand for shipment during the third quarter of the year and the market has remained steady, sales being made of Connellsville, Pocahontas and New River 72-hour Foundry Coke on the basis of $3, and Furnace Coke on the basis of $2, at the ovens.

## Philadelphia.

FORREST BUILDING, August 25, 1903.

For the first time in many weeks it is possible to say that the outlook is a little better. There is more business, more uniformity in prices and a less disposition to force sales. Makers of Pig Iron are beginning to find that recent selling prices are down to cost of production, and it becomes a question whether they should continue selling at current prices until cost can be reduced or attempt to get a little more money on the present basis of cost. Some think the last named alternative is feasible, and their asking prices are a little higher than they were a week ago. It can hardly be said that distinctly better prices are ruling, but it is certain that good Foundry Irons are more firmly held and concessions that would have been made a week ago on large lots would not be as readily agreed to to-day. Some quite large sales have been made at what are considered good prices, relatively speaking. Of course there is nothing that can be construed as an advance, but there can be no doubt that the declining tendency has exhausted itself temporarily, even if not permanently. This, however, applies mainly to Foundry Pig Iron. Mill Irons are in good supply, and a considerable tonnage has been sold on the basis of $15.25 to $15.50, delivered. Nothing encouraging can be said in regard to finished products. Bar Iron is somewhat more active, but the demand is still below what is necessary to keep the mills actively employed. Probably three-fourths time would be a fair average in the Bar mills, and moderately full on Plates and Structural Material. Including all the various interests, it may be said that they are doing a little better than at any time since the midsummer holidays, but the amount of work taken in during that period falls much below what has been sent out. The immediate future, therefore, depends on sales during the next five or six weeks. A year ago the loss of orders for two or three months at a time would have made no difference, but during the remainder of this year a great deal of new business is the only thing that can save the market. Many mills and furnaces must have orders immediately or they will have to cut down their output. Which is it to be? As we have already stated, there are some indications of a better demand, but to what extent time alone can tell. Two, or at most three or four, weeks will no doubt decide the character of the market for several months to come. The chances for better or worse are about even, although movements during the past few days give some encouragement to the brighter side of the situation.

**Pig Iron.**—The Pig Iron situation begins to show that it has two sides. During the past two or three months it was a continual pressure to sell, and a continual decline in prices, but slight changes have become noticeable within the past few days. They are not important unless on the theory that straws show the way the wind blows, and even then the wind may die out. Nevertheless, there is a better demand for good Foundry Irons and sellers are inclined to be somewhat firmer in their quotations. It has not been shown that they can get more money than they did last week, but sellers will certainly not make the concessions that they would have done at that time, and to that extent the market is better. Naturally the inquiry will be what makes it better? The reason appears to be, that there is a considerable decrease in production, and good Foundry Irons, if not scarce, are certainly not plentiful, so that makers see no reason for accepting business at lower prices. On the contrary, there is a feeling that the decline has been (if not premature) a little too rapid, so that there is a disposition to recover lost ground if it is possible to do so. This is shown by increased firmness, and in some cases a withdrawal of extreme low prices. It may not amount to much, but it shows a change of sentiment, and may result in $17 as an inside price for No. 2 X Foundry. Sales have been made at $16.50 and $16.75 to first-class buyers, but after selling considerable quantities at these prices, there is a tendency to ask $17 and shade a little perhaps, if the buyer is a specially desirable one. Mill and other Irons have not shown as much strength as Foundry grades, but things are working toward an adjustment, and it looks like $15.50 for Mill Irons and $17 for No. 2 Foundry, as fair average prices during the coming month; 25c. to 50c. additional for small lots, and possibly slight concessions for lots of 1000 to 2000 or 3000 tons, deliveries covering the remainder of the year. This is merely a surmise based on conditions which appear to be developing, but a good deal will depend upon the two important factors—viz., finance and crops. If these come out satisfactorily the Iron trade may again assume a condition of great activity, but easy money and good crops are a *sine qua non* for anything of that kind. To-day's prices for Philadelphia and nearby deliveries would be about as follows for ordinary sized lots, large orders at inside or possibly slightly lower figures:

| | |
|---|---|
| No. 1 X Foundry | $18.00 to $18.50 |
| No. 2 X Foundry | 16.75 to 17.50 |
| No. 2 Plain | 16.00 to 16.50 |
| Standard Mill Irons | 15.25 to 15.75 |
| Ordinary Mill Irons | 15.00 to 15.25 |
| Basic | 15.75 to 16.00 |

**Steel.**—There is some business doing on the basis of about $28.50 to $29, delivered, for Basic. Bessemer is offered at $28.25 and German Basic at $27, ex-ship, duty paid. There is a good deal of Steel wanted, but it is not expected that there will be much change in prices, although on large orders prices might, perhaps, be shaded a little.

**Plates.**—Business is dull—there can be no doubt of that. Shipbuilders aid other large consumers are getting very little new business, so that order books are in a less favorable condition than they have been for several months past. Prices are unchanged, but the falling off in demand is rather discouraging. Quotations are as follows for city and nearby deliveries, base prices up to 100 inches: Tank Steel, both Sheared and Universal, 1.75c. to 1.80c., in large lots; Flange, 1.85c. to 1.90c.; Commercial Fire Box, 1.95c. to 2c.; Locomotive Fire Box, 2.25c. to 2.30c.; small lots, 10c. to 15c. per 100 extra; 100 to 110 inches, 0.05c. extra; 110 to 115 inches, 0.10c. extra; 115 to 120 inches, 0.15c. extra; 120 to 125 inches, 0.25c. extra; 125 to 130 inches, 0.50c. extra; over 130 inches wide, 1c. extra; Plates under ¼ inch on edge, 0.10c. extra; under 3-16 inch on edge to No. 8, 0.15c. extra; No. 9, B. W. G., 0.25c. extra; all Sketch Plates, 0.1c. extra; all Circle Plates, 0.2c. extra.

**Structural Material.**—There is so little change that almost the same remarks would hold good from week to week. Mills are doing fairly in some departments, in others orders are scarce, the average tonnage being inadequate for full or profitable employment. Prices are unchanged, viz.: Beams, Angles or Channels, ordinary sizes, 1.73½c. to 1.80c. for carload lots, with the usual addition for smaller quantities.

**Bars.**—Bar Iron is in somewhat better demand, but is by no means active. A good many inquiries have been made and options given on a fair tonnage, but it is still uncertain how much will be taken. Prices are usually about 1.60c. for best Refined Iron, although some quote higher figures and some accept less. All depends on quality, however, and for strictly best Refined Iron 1.60c. is an inside figure. Steel Bars, 1.73½c. to 1.80c.

**Sheets.**—The demand for Sheets shows some improvement, but the mills expect a considerable increase in the near future, as stocks are low, and many inquiries are being made. Prices unchanged, but slightly firmer than during the past several weeks.

**Old Material.**—The market is too irregular to give exact quotations, but it is not unlikely that bottom figures have been reached, temporarily anyway. Heavy Melting Steel has been sold at $17, and other articles in proportion, and at these figures it is thought that good buying will be met with. For the present, however, bids and offers for deliveries in buyers' yards are about as follows:

| | |
|---|---|
| Old Steel Rails | $16.75 to $17.50 |
| Heavy Steel Scrap | 16.25 to 16.50 |
| Low Phosphorus Scrap | 24.00 to 25.00 |
| Old Steel Axles | 18.00 to 19.00 |
| Old Iron Rails | 19.00 to 20.00 |
| Old Iron Axles | 19.00 to 20.00 |
| Old Car Wheels | 19.00 to 20.00 |
| Choice Scrap, R. R. No. 1 Wrought | 17.00 to 18.00 |
| Country Scrap | 15.00 to 16.00 |
| Machinery Scrap | 15.50 to 16.00 |
| No. 2 Light Scrap | 16.00 to 17.00 |
| No. 2 Light (Ordinary) | 11.00 to 12.00 |
| Wrought Turnings | 13.00 to 14.00 |
| Wrought Turnings, Choice Heavy | 14.50 to 15.00 |
| Cast Borings | 8.25 to 8.75 |
| Stove Plate | 11.75 to 12.25 |

Walter Graham, who is well known in connection with the Iron, Coal and Ore trades, has opened offices in the Harrison Building, Philadelphia, Nos. 609-612, for the sale of the above products. A department under the management of Theo. F. Patterson will include as specialties Bar Iron and other Finished products.

Crocker Brothers, Philadelphia, have taken over the business of William Dette & Co., William Dette having associated himself with Crocker Brothers in their New York office. To secure more spacious quarters, Crocker Brothers will move their Philadelphia offices on September 1 to suite 1114, Pennsylvania Building, Fifteenth and Chestnut streets.

## Cincinnati.

FIFTH AND MAIN STS., August 26, 1903.—(*By Telegraph.*)

The Pig Iron market has been very much more active during the past week than it has for some little time, but few round lot orders are reported as closed. Yet the total amount disposed of foots up very comfortably into the thousands of tons. A few sellers report sales running throughout the year, and a few sales are reported covering the first quarter of next year, but, as a rule, the Iron which has been selling has been to cover immediate necessities, and in a number of instances the exigencies of the buyers crop out in telegrams for immediate forwarding. The buyers who are thus covering their present wants are of a class who usually buy for delivery pretty well into the future, and this fact emphasizes the statement that it will not be long until they are in the market again for their wants. As to prices, a considerable amount of that which has been sold has gone on the general basis of $12, Birmingham, for No. 2 Foundry. In this immediate vicinity sales amounting to 6000 tons of Foundry Iron are reported on that basis, but it is believed that most of the Iron selling is going at a quarter less per ton. It appears that the Associated Southern Furnaces have instructed their agents to ask $12, and to hold as rigidly to that basis, but they have also advised that desirable business be submitted to them if on the basis of $11.75 for approval. The consequence of this has been to open the door just wide enough to let the most daring in on the basis of $11.75. In the immediate vicinity of Cincinnati some 10,000 tons of Foundry Iron are reported sold on this last mentioned scale. One seller reports a sale of a large round lot of Gray Forge on the basis of $10.50, Birmingham. Northern Irons are a little bit irregular and quotably, perhaps, 50c. a ton lower than they were a week ago, but they were still above the Southern price by quite a little margin. Sellers are divided as to the outlook. Some say that the attitude of buyers and the amount of inquiry in sight justify the belief that there will be a good hand to mouth trading. There does not appear to be much indication of a general buying movement to cover the balance of the year or any portion of next year. Freight rates from the Hanging Rock district, $1.50, and from Birmingham to Ohio River points, $3.25. We quote, f.o.b. Cincinnati, for delivery throughout the year, as follows:

| | |
|---|---|
| Southern Coke, No. 1 | $15.50 to $15.75 |
| Southern Coke, No. 2 | 15.00 to 15.25 |
| Southern Coke, No. 3 | 14.50 to 14.75 |
| Southern Coke, No. 4 | 14.00 to 14.25 |
| Southern Coke, No. 1 Soft | 15.50 to 15.75 |
| Southern Coke, No 2 Soft | 15.00 to 15.25 |
| Southern Coke, Gray Forge | 14.00 to 14.25 |
| Southern Coke, Mottled | 14.00 to 14.25 |
| Ohio Silvery, No. 1 | 20.15 to 21.15 |
| Lake Superior Coke, No. 1 | 16.65 to 17.15 |
| Lake Superior Coke, No. 2 | 16.15 to 16.65 |
| Lake Superior Coke, No. 3 | 15.65 to 16.15 |
| *Car Wheel and Malleable Irons.* | |
| Standard Southern Car Wheel | $25.75 to $26.25 |
| Lake Superior Car Wheel and Malleable | 23.00 to 23.50 |

## Cleveland.

CLEVELAND, OHIO, August 25, 1903.

**Iron Ore.**—Another week has passed without any sales. The producers have demonstrated little concern, being hopeful of the ultimate disposal of this year's output. No unsold Ore, however, will be brought down the lakes. The movement from the head of the lakes, in wild boats, is still heavy, but shipments through Marquette have eased, and a further decline has been noted in the shipments through Escanaba. Wild rates of carriage have remained stable at 80c. from Duluth, 72½c. from Marquette and 60c. from Escanaba. Ore prices have held steady at $4.50 for Bessemer Old Range and $4 for Bessemer Mesaba.

**Pig Iron.**—The reduction of the association price of Southern Pig Iron to a $12 basis, Birmingham, brought about a corresponding reduction in the prices of Northern Iron and also developed considerable business. As soon as the Southern companies announced their action buying began, the first sale reported in this territory being 2000 tons for a consumer in Central Ohio. The Northern Valley furnaces quote No. 2 Foundry at $16 to $16.50, in the Valley. At this price sales were made running from 200 to 1000 tons. The number of sales has been much heavier than at any similar period for months, and a good buying movement seems to have started. The Southern furnaces announce that they are willing to take contracts for delivery indefinitely in future at these prices, and some of the Northern furnaces have made the same provision. Quite a number of the Valley and Pittsburgh furnaces, however, state that at ruling prices deliveries are not to be promised after November 1. From that date forward they expect to make prices somewhat different from those now prevailing. This announcement gave further strength to a situation already strong and inclined many of the buyers to cover a considerable tonnage with furnaces that made no such provision. In the main, however, the buying has been of a hand to mouth nature, small lots ruling. Some consumers have tried to break the price still further. The Coke situation in the Valleys is about all that could have been desired. A few of the furnaces, which have been out of blast for the necessary repairs, have resumed activity, and production is heavier. Shipments from the furnaces have not eased any, and consumption still keeps pace with production. The Foundry buyers have been somewhat uneasy recently and the present buying movement, which is more or less general, has given a decidedly better tone to the entire market. In Basic very little Iron remains to be sold for immediate shipment. The demand for material on contract is heavy and shipments are free. Considerable discussion is going of fourth-quarter prices, with furnacemen hopeful that the price will hold at $18. Bessemer rules about $18 in the Valley, but with no definite transaction upon which to base such a quotation.

**Finished Iron and Steel.**—This week has developed a buying movement in Bars. The leader has been Bar Iron, upon which prices have been reduced. The prices which

hitherto have been generally quoted have been 1.55c. in the Valley, or 1.60c., Cleveland, but it is definitely known that on many transactions 1.50c., Youngstown, has been made. It is understood that upward of 2500 tons were taken in one contract for Bar Iron at 1.50c., Youngstown. Small lots of 200 to 500 tons have been covered at varying prices. It is rather difficult to reconcile this statement with the other one, made authoritatively, that a good buying movement of Bar Steel has set in at prices which have ruled heretofore—namely, 1.60c., Pittsburgh, for Bessemer, and 1.70c., Pittsburgh, for Open Hearth. It is said nevertheless that Bessemer Steel Bars have been sold in lots ranging above 500 tons at the price named. The buying of Billets has been firm and heavier. The price has held without a break, giving color to the statement made about the sale of Steel Bars. Several round lots have been sold at $27.50, Cleveland. There has also been a better demand for Plates. The market for that material is still restricted and orders coming in are small. The Plate trade, on the whole, is inclined to be weak. All of the smaller mills are looking rather sharply for business. Mills are able to make almost immediate shipment on large contracts. Specifications against contracts are fairly heavy. The Sheet trade is unchanged. Some of the smaller mills are getting a fair business at reduced prices, but the larger mills rather than reduce the price have decided to suspend operations temporarily. Lately the business has rallied sufficiently to prevent a shut down, but the mills still need business. Prices are quoted as follows, with the understanding that they can be shaded in certain places: No. 27 Black Sheets, out of stock, 3.05c. as a basis; No. 14 Blue Annealed, in car lots at the mill, 2.20c.; No. 27 one pass cold rolled, in car lots at the mill, 2.75c.; Galvanized Sheets, out of stock, No. 27 as a basis, 4c. The Structural trade has slightly improved. A buying movement is anticipated, the hope being based on inquiries for material with which to complete work interrupted by the labor difficulties.

**Old Material.**—There has been really no market of which to speak. Buying has been light and trading impossible on any basis. Heavy Steel and Railroad Wrought have sagged in price a little. Otherwise the market remains unchanged. Prices revised are quoted as follows, all gross ton: Heavy Melting Steel, $17.50; Old Steel Rails, $18.50; Old Iron Rails, $22; Old Car Wheels, $19, Railroad Malleable, $17; Cast Borings, $8.50. All net tons: No. 1 Railroad Wrought, $16.50; No. 1 Busheling, $14.50; Wrought Turnings, $12; Iron Car Axles, $22.50; No. 1 Cast Scrap, $14.50; Stove Plate, $11.50.

## Birmingham.

BIRMINGHAM, ALA., August 24, 1903.

As foreshadowed in last letter, the market price of Iron was lowered the past week by the Associated Furnaces, and what business is now being done is on the basis of $11.50 for No. 3 Foundry. The cut has put more life into the market, and business has increased in volume. It has materially eased up the situation and given a modicum of confidence to operators, who could not do business on the basis of $13.

Local buyers have been prominent in taking hold, and they have secured several respectable lots. But there is a disposition with some to defer purchases until they see the full effect of the drop. There has not as yet developed any disposition to buy to any extent for deferred deliveries. There is a contingent which sees in the reduction of price only a prelude to still lower prices, and it will require a firm maintenance of values to change their convictions. The probability of a steady market seems good, for that is what the association furnaces are working for and most desire.

Taking the evidence of the Iron masters as given before the Court of Arbitration and supported by their cost sheets, at prevailing prices there is no undue average profit. While one stated that at prevailing cost of material and fixed charges Iron could be made at $8.50 in this district, another testified that it was costing his company over $10 per ton. And the average cost for the district is nearer $10 than $8. One or two furnace interests are very favorably situated as regards minimum cost, and all are placing more or less of their earnings to the betterment of their plants at the expense of dividends. The president of the leading interest stated in his testimony that they had in contemplation the building outright of new furnaces to replace those now in use, at an estimated cost of $500,000 to each furnace—say $7,000,000 in all. The furnace now being erected, it is calculated, will cost $540,000, and as much as $850,000 is being expended for other improvements, in which is included greater efficiency at their Ore mines. It takes time to be rewarded with returns.

The Sloss-Sheffield Company have been gradually improving their plants, and the result has been very gratifying to them. Their Philadelphia furnace, at Florence, is now turning out over 200 tons daily, with a fine prospect for a long continuance of this good work. The Brown Ores at Russelville are amply able to supply the requirements of their Sheffield and Florence furnaces. In October they will have their seventh furnace, now undergoing repairs, ready for the torch.

The Tennessee Company have about completed repairs on their No. 2 furnace, at Bessemer, and that will be ready for work early in September.

The Alabama Consolidated Coal & Iron Company on Saturday started their new furnace, which they claim is the largest in the State. It is modern in every respect and equal to the modern type of the Northern furnace. The new No. 2 furnace, at Thomas, which has been out for repairs, was blown in on Saturday. All the latest improvements have been added to it and everything points to a good record by it. Then there is the Lacey-Buck Furnace, which has been undergoing repairs, about ready for the torch, and equipped with the latest labor saving appliances. These are mentioned to show that the necessity for the adoption of these labor saving and cost reducing appliances is realized by our furnacemen, and that they are installing them. Those furnaces being built will also adopt them, so that besides economy in cost of production, we will have increased output.

The Arbitration Commission rendered their award Saturday night. It might be termed a compromise verdict. It was a source of surprise in some quarters to see wages advanced in the face of a falling market, but as all the decisions were reached by a unanimous vote, they should be and will be accepted in good faith and carried out "as nominated in the bond." The scale of wages is based on the selling price of Iron, as has been the case heretofore, viz.:

When Pig Iron is selling at $8 per ton, the wage to the Coal miner is 47½c. per ton. When Iron is $9 it is 50c. per ton, and the increase follows the increased price of Iron up to $11.50 per ton, when it becomes 57½c. This, then, becomes the maximum price, no matter how high Iron goes, and 47½c. is the minimum price, no matter how low it goes. This is an advance of 2½c. over the old scale, and at one time was offered by the operators and withdrawn upon agreement of arbitration. Day wages are proportionally increased.

The monthly pay day is superseded by the semimonthly pay day, and what are called commissary or company store checks, issued upon request to those men who draw supplies against labor performed, are made nontransferable. The face value of these checks represents their purchase power at the store.

On narrow work the price was reduced from $2.84 to $2.71 per yard. The differential between mining with machinery and with the pick was not decided, because of the limited use of machinery. That was left to a committee, whose decisions will be based on results obtained in the mines where machinery is used.

The minimum number of days that a miner shall work in a month is placed at 20. Provision is made for sickness and unavoidable causes of absence from the mines. No boys under 14 years are to be permitted in any of the mines as laborers.

It is a great relief to the district to realize that the matter is finally settled and that the decision will be carried out in good faith. Neither side received all it claimed, and as the decision was unanimous, both sides are compelled to accept it with good grace and carry it out in good faith. In a financial sense it was expensive to both sides, but it impressed the contestants with the feeling that some rough places had been made smooth and some sore spots had been healed. It brought the employer and the employee closer together and imbued each with a feeling of increased respect for their respective rights. The result proved that arbitration brings out facts and develops moderation, while strikes incite passion and breed intolerance.

## St. Louis.

CHEMICAL BUILDING, August 26, 1903.—(*By Telegraph.*)

**Pig Iron.**—The general volume of sales, while of the 50 to 200 ton variety, have been quite large the past week. Most transactions call for delivery immediately or within the next two months, and although some of the most prominent interests are buying, little inclination is being shown to cover far ahead. We hear of some few sales of Malleable Bessemer, but the Southern Foundry Irons are most in demand. We quote, f.o.b. St. Louis, as follows:

| | |
|---|---|
| Southern, No. 1 Foundry | $16.25 to $16.50 |
| Southern, No. 2 Foundry | 15.75 to 16.00 |
| Southern, No. 3 Foundry | 15.25 to 15.50 |
| Southern, No. 4 Foundry | 14.75 to 15.00 |
| No. 1 Soft | 16.25 to 16.50 |
| No. 2 Soft | 15.25 to 15.50 |
| Gray Forge | 14.75 to 15.00 |
| Southern Car Wheel | 26.75 to 27.00 |
| Malleable Bessemer | 19.25 to 19.75 |
| Ohio Silvery, 8 per cent Silicon | 23.00 to 23.50 |
| Ohio Strong Softeners, No. 1 | 19.25 to 19.75 |
| Ohio Strong Softeners, No. 2 | 18.75 to 19.25 |

**Bars.**—Jobbers report a considerable volume of business for Bars, and it is thought that the demand is in excess of last year, which is a very gratifying showing. In lots from store 2.15c. to 2.25c. continues to be the quotation.

**Rails and Track Supplies.**—Business in this department has been fairly maintained the past week. We quote as follows: Splice Bars, 2.05c. to 2.15c.; Bolts, with Hexagon

Nuts, 3.05c. to 3.15c.; with Square Nuts, 2.90c. to 3c.; Spikes, 2.15c. to 2.25c.

**Angles and Channels.**—The market for Small Angles and Channels has been very steady the past week, and indications point to continued improvement. Jobbers' quotations from store are 2.25c. to 2.40c.

**Pig Lead.**—The Lead market has shown a continued firmer tendency and the demand for quick shipment has increased. Missouri brands are said to be readily salable at 4.15c. to 4.15½c.

**Spelter.**—Offerings continue in light volume, and it is said that bids of from 5.60c. to 5.75c. have been made for deliveries for the next two months.

## Pittsburgh.

PARK BUILDING, August 26, 1903.—(*By Telegraph.*)

**Pig Iron.**—There has been no heavy buying of Bessemer Pig Iron here since our last report, but on the contrary the market is very quiet and prices are still inclined to seek a lower level. A number of consumers, including the leading interest, are not taking in Iron as promptly as some time ago, with the result that a good deal of tonnage is being offered for resale. Some lots of Bessemer Iron have been offered as low as $16.50, Valley furnace, equal to $17.35, Pittsburgh. However, no very large lots of Iron could be had at this price, the general market on Bessemer Pig being $17 to $17.10, at Valley furnace, or $17.85 to $17.95, Pittsburgh. Market indications are that there will be no buying in Bessemer Iron for some time, and it is probable some stacks in the two valleys will be blown out until the demand improves. Northern No. 2 Foundry Iron is being freely offered at $16.75 to $17, Pittsburgh, but tonnage being placed is only for small lots. There is really no incentive to buy ahead, as indications do not favor higher prices for Pig Iron in the near future. The official price of Southern No. 2 Foundry is $12, Birmingham, or $16.85, Pittsburgh; but the Southern Furnace Association allows a rebate of 25c. a ton on large tonnage of Forge and Foundry Iron, so that the price on good sized lots of Southern No. 2 is $16.60, Pittsburgh, and this price is being quoted. Northern brands of Forge Iron are nominally $16, Pittsburgh, but on a firm offer $15.50 to $15.75 could likely be done. The official price of Southern Forge is $15.60, Pittsburgh, and we note sales of several hundred tons at that price.

**Steel.**—The Steel market is being disturbed to some extent by the offering for resale of two lots of Billets, one lot being Open Hearth, by a mill in Eastern Pennsylvania, and the other Bessemer Billets by a Sheet mill plant in West Virginia. These two lots of Steel have been freely offered to brokers and consumers alike at prices slightly under the pool prices, but so far neither lot of Steel has been purchased. Sales of Billets and Sheet Bars made by the mills in the Billet arrangement are small lots only, but at full prices. We quote Bessemer Billets at $27, Open Hearth at $28, Bessemer Sheet Bars, random lengths, $28, and Open Hearth, $29, f.o.b. Pittsburgh delivery.

(*By Mail.*)

The generally quiet condition which has prevailed in the Iron trade for the past month or two continues, and the amount of new tonnage being placed in Pig Iron, Steel and finished products is relatively small. It would seem that both sides of the market are playing a waiting game, the manufacturers not pressing their products on the market, while consumers are either holding off altogether or else are placing small orders for actual needs only. No sales of Pig Iron of any consequence are being made, and some of the largest consumers, including the United States Steel Corporation, are not taking in Iron as promptly as they did a month or two ago. In spite of this it is said that the furnaces in the Bessemer Furnace Association will not have over 150,000 tons of surplus Iron to sell in the open market in the last quarter of the year. The output of Pig Iron for the balance of this year is not likely to show any increase over July and August, which two months showed a large falling off as compared with previous months of this year, and with the finishing mills having a normal demand for their products, there ought not to be any increase in the stocks of Pig Iron at the furnace yards. Hannah Furnace of the Republic Iron & Steel Company, at Youngstown, and one stack of the Andrews & Hitchcock Iron Company, at Hubbard, started up in the past week. The Steel market is rather quiet, and the small tonnage of Billets, Sheet and Tin Bars being sold by the mills in the agreement is at full official prices. Reports in the trade that some of the mills in the agreement were shading prices on Steel are denied. On the contrary, some of the outside Open Hearth Steel plants are selling their surplus Steel in the form of Billets and Bars at slightly higher than pool prices. There is nothing of special interest to note in Finished Iron and Steel, the demand being only moderate, except in Pipe, and in this trade a good deal of tonnage is being placed. The outlook in the Structural trade is regarded as bright, as a very large amount of new work is coming up. The machinists and their employers at Youngstown, Ohio, came to a wage agreement on Tuesday morning, August 25, details of which are given elsewhere in this issue.

**Rails.**—It is officially stated that the Baltimore & Ohio Railroad have placed contracts for 50,000 tons of Rails for 1904 delivery, 28,000 tons going to the Carnegie Steel Company, the balance being divided between the Cambria and Maryland Steel companies. It is said that some of the large Eastern and Western roads are figuring on their requirements for next year and may soon come in the market with their contracts. The suburban traction lines are buying heavily of Steel Rails, and the tonnage being booked by the mills from these roads is quite large. We quote at $28, at mill, for Standard Sections in 500-ton lots and over.

**Muck Bar.**—The market is very quiet and we do not hear of any sales. Domestic Muck Bar is quoted at $29.50, Pittsburgh, but the market is weak and a firm offer would likely shade this price. A good deal of Eastern Muck Bar is being offered in this market at about $29 or less.

**Iron and Steel Bars.**—The general demand for both Iron and Steel Bars is only moderate and some of the leading mills are running very slack, being in need of specifications. Prices on Iron Bars are being shaded more or less and seem to have settled down to about 1.60c., Pittsburgh, but for a desirable specification possibly a lower price would be made. We quote Steel Bars at 1.60c., Pittsburgh, in carloads and larger lots. For quantities less than 2000 lbs., but not less than 1000 lbs., $2 a ton additional is charged, and less than 1000 lbs., $6 additional.

**Ferromanganese.**—The market is very quiet. We quote domestic and English Ferro at $50, delivered, for 50-ton lots and over. The market on Ferro is none too strong, and possibly on a large contract this price might be shaded.

**Plates.**—New tonnage in Plates is fair, but the large contracts from the Steel car interests and other consumers, which were so plentiful early in the year, are lacking now and some of the leading Plate mills are in need of specifications. It is believed that demand for Plates will soon show improvement, as the Steel car interests report more inquiries for cars, which would mean tonnage in Plates. Prices are firm and we quote: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70s.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches wide, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

**Structural Material.**—While no very large contracts are being placed there is a steady run of small orders, which foot up considerable tonnage. A good deal of new work is coming up and the outlook for the balance of this year is fairly good. Inquiries are now in the market for a new Steel bridge, connecting Wheeling and Bellaire, and also a new Steel bridge at Steubenville. The old Union bridge at the point in this city, which is a wooden structure, is to be replaced by a modern Steel bridge. These three bridges alone will require about 16,000 tons. There is also a new union depot at Nashville, two large buildings in the same city and a large hotel building at Louisville, which will be in the market before long. The Steel for the Oliver Building on Wood street, about 4800 tons, is being furnished by Carnegie Steel Company, and fabricated in the shops of the McClintic-Marshall Construction Company, at Rankin. No large buildings are projected for this vicinity for this year, but if the various labor troubles are settled new building will be active in Pittsburgh next year, as some large structures, including a new hotel on the Cathedral site, are to be erected by local capitalists. The mills are making prompt deliveries and we quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.70c.

**Hoops and Bands.**—The three leading mills have reaffirmed prices of Hoops and Bands on the old basis. New tonnage is light, but inquiries are said to be better than for some time. We quote: Cotton Ties, 87c. in 10,000-bundle lots or over; 92c. for carloads; Steel Hoops, 1.90c. in 250-ton lots and 2c. for carloads; Bessemer Bands, 1.60c. to 1.70c. for Open Hearth. Extras as per Steel card.

**Sheets.**—Some fair sized contracts for Black Sheets have been placed in the past week and inquiry is said to be better than for some time. However, quite a number of the leading Sheet mills are closed for repairs and also for lack of orders. We continue to quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.60c., and No. 28 at 2.70c., f.o.b. at mill. It is possible that on a very nice specification this price might be slightly shaded by some mills. We quote Galvanized Sheets at 75, 10 and 5 per cent. off in carloads and larger lots, f.o.b. maker's mill. For small lots from store jobbers charge the usual advance over these prices.

**Rods.**—The market is rather quiet, and we quote Bessemer Rods at $35 and Open Hearth at $35.50 to $36. Chain Rods are held at $37.50 to $38, Pittsburgh.

**Tin Plate.**—A fair amount of new orders is being placed and the mills are pretty comfortably filled for the next several months. We continue to quote at $3.80, Pittsburgh, for 100-lb. Coke Plates, but in some cases the outside mills are able to get a slight advance over this price for early delivery.

**Skelp.**—The market remains very quiet and we do not hear of any sales. We quote Grooved Iron and Steel Skelp at 1.80c. to 1.82½c. and Sheared at 1.85c., Pittsburgh delivery.

**Pipes and Tubes.**—The Merchant Pipe trade continues in a very satisfactory condition, the demand being large, and the mills are well filled up on the smaller sizes for the next several months and on 6-inch and larger well up to the close of the year. Prices are firm, discounts to consumers in carloads being as follows:

*Merchant Pipe.*

| | Steel. | | Wrought Iron. | |
|---|---|---|---|---|
| | Black. | Galv. | Black. | Galv. |
| | Per cent. | Per cent. | Per cent. | Per cent. |
| ⅛, ¼ and ⅜ inch | 68 | 58 | 65 | 55 |
| ½ inch | 70 | 60 | 67 | 57 |
| ¾ to 6 inches | 75 | 65 | 72 | 62 |
| 7 to 12 inches | 69 | 59 | 66 | 56 |

*Merchant Boiler Tubes.*

| | Steel. | Iron. |
|---|---|---|
| 1 to 1½ inches | 42½ | 39 |
| 1¾ to 2½ inches | 55½ | 38 |
| 2¾ to 5 inches | 61 | 48 |
| 6 to 13 inches | 55½ | 38 |

The outside mills rolling Iron Pipe are naming lower discounts than are given above.

**Iron and Steel Scrap.**—The Scrap market continues lifeless and consumers practically refuse to take it in at any price. Heavy Melting Stock has been offered as low as $17 in gross tons, and No. 1 Wrought Scrap at $16.50 in net tons, or less. Cast Iron Borings are freely offered at $8 to $8.50 in gross tons. Sheet Scrap has also gone off $4 to $5 a ton in price.

**Coke.**—The Coke market does not show any improvement either in demand or prices. The leading operators are cutting down the output of Coke as much as possible, the leading plants being idle one day a week. Connellsville Furnace Coke continues to be offered at $2 to $2.25 a ton for prompt shipment. Foundry Coke is about $3 a ton at oven. Some consumers of Coke have shut off shipments, and this releases a good deal of Coke that has to be sold in the open market at almost any price it will bring.

## Scientific and Technical Notes.

Stains on tracings, caused by blue print water, can be removed by painting the spot with a camel's hair brush, dipped in a 10 per cent. solution of potassium oxalate. This same solution may be used for making lines on blue prints. Almost any alkali will bleach a blue print, but this particular one will turn the blue to a pure white.

Over exposed blue prints can, in many cases, be restored by immersing them in a bath of weak ammonia, using about two spoonfuls of ammonia to a tumblerful of water. This will cause the print to turn first purple then pink and after a time nearly white. When it has reached the pink stage rinse it and immerse in a bath composed of one teaspoonful of hydrochloric acid in one tumblerful of water. The blue color will then return much brighter than before, but this time the lines will be white and clear. Wash thoroughly before drying.

The constant increase in the size of ocean steamships is well illustrated by reports of the entries and clearances from the port of New York for the years 1901 and 1902. In 1901 the entries numbered 4215, of 8,933,185 gross tons, or an average of 2119 tons; in 1902, figures of 3954 ships and 8,990,851 tons give an average of 2274. The clearances in 1901 numbered 3777, of 8,400,977 tons gross, or an average of 2224; in 1902, 3685 clearances and 8,441,206 tons give 2291. It will be noted that in both entrances and clearances, the number of ships fell off while the tonnage increased.

Some 20 years ago, when Dr. Langley invented the bolometer, the instrument was able to measure temperatures to about the hundred-thousandth of a degree. Since then, during 15 years of constant advance, latterly associated with a great improvement in the adjuncts, particularly of the galvanometer, at the hands of C. G. Abbott, this device has been brought to measure somewhat less than the hundred-millionth of a degree, and this almost infinitesimal amount is distinguished with readiness and precision.

Professor Goodspeed of the Morgan Laboratory of Physics, University of Pennsylvania, has communicated to the American Philosophical Society his discovery that rays emanating from the human body possess a photographic potency. He thinks that from each human being there emanates a characteristic and unique quality of rays which are probably visible to certain animals in the dark. He discovered this by observing that rays from his own body absorbed the rays from a Crookes tube, transforming them into rays of a different quality, which produced radiographs through sheets of lead impervious to the Roentgen rays.

Some interesting experiments on the effect of concussion on living bodies have recently been made in the French Navy. Some sheep were put in the "Henri IV," at quarters, and one of the big guns was fired over them. They were stunned, but readily recovered; the inference is that human life will also survive the effect of the blast. Sheep were then put in a submarine, submerged, and torpedoes exploded near them. Neither the submarine nor the sheep were hurt. The boat was then brought to the surface, and sailors substituted for the sheep. These also survived the shock of torpedoes exploded near by, so that the idea of a submarine being destroyed by its own torpedo must in future be discounted.

Interest has been revived in the inspiring project of continuous railway connection between the United States and the numerous republics of Central and South America, by the recent action of Congress in making a small appropriation toward the cost of further inquiry. The distance from New York to Buenos Ayres is about 10,200 miles. There is now continuous rail communication from New York to Tehuantepec, a distance of 3500 miles, and a further line to the southern border of Mexico, 400 miles more, is projected. Of the remaining 6300 miles, about 1400 are covered by existing railways, leaving for future construction about 4900 miles. It is estimated that about $200,000,000 would be needed to construct the missing links and finance a company to operate the new lines.

A number of four-cylinder compound tank locomotives have been supplied by a German firm to the Central de Aragon Railway, in Spain, which are claimed to be the heaviest and most powerful engines of this type in existence. Each has 12 drivers, in two sets of six each, the rear set being operated by the high pressure cylinders and the forward set by the low pressure cylinders. The cylinders are 18½ and 28 inches in diameter by 23⅝ inches stroke; the drivers have a diameter of 43 inches the total heating surface is 2600 square feet, and the grate surface 46½ square feet. The boiler pressure is 175 pounds per square inch; the weight of the engine complete being 108 tons.

A regular service of steam motor cars, built by Komarek of Vienna, was started on May 1 on the highway between Mank Kirchberg and Saint Poelten, in Austria, at a scheduled speed of 25 km. (about 15½ miles) per hour. The engine and boiler are mounted on the front platform of the car, which carries a separate compartment for passengers.

A committee recently appointed by the American Institute of Electrical Engineers has the somewhat novel duty of gathering data of use in the electrical engineering profession, especially with regard to new and special subjects. It is thought that many engineers may have curves, empirical formulæ and other data of great value, which they might be willing to give to the profession through the institute. Such data are usually regarded as more or less in the light of trade secrets, being, as a rule, the result of much arduous work, and consequently are closely guarded from outsiders; but as engineers are, in the main, inherently generous, it is quite likely that important information may be obtained by the committee.

## Metal Market.

NEW YORK, August 26, 1903.

**Pig Tin.**—Owing to a general lack of interest in the market and withdrawal of support during the last few days, prices have gradually worked downward, and at this writing they are lower than they were a week ago. Business has been very slight throughout the week, demand being still limited so far as consumers are cncerned. Deliveries have been slow and will show a heavy decrease for this month. For closing prices to-day we quote spot and August, 27.70c. to 27.85c.; September, 27.40c. to 27.75c. London, spot, £126 2s. 6d.; futures, £124. The arrivals thus far this month show 2930 tons, and the afloats are figured at 1875 tons.

**Copper.**—There are signs of weakening on the part of certain members of the latest bull movement. While everybody is supposed to be holding firmly to the "official" figures of the Copper Committee of the New York Metal Exchange, it is an open secret in the trade that the figures are being cut from ⅛c. to ⅜c., according to grade and other conditions. Consumers are still buying from hand to mouth. The "official" figures are as follows: Lake, 13¾c. to 13⅞c.; Electrolytic, 13⅝c. to 13¾c.; Casting, 13⅜c. to 13½c. The London market quotes as follows: Spot, £58 17s. 6d.; futures, £58 2s. 6d. Best Selected, £64.

**Pig Lead.**—Spot is still scarce and the market firm. The prices of the American Smelting & Refining Company are unchanged, being on a basis of 4.10c. for 50-ton lots and 4.12½c. in carload lots. Outside lots of spot are quoted here 4.25c., and delivery for the balance of this month is bringing 4.20c. The London market has declined slightly to £11 3s. 9d.

**Spelter.**—The market is strong and unchanged, and spot to August closed to-day at 6c. The London market is also advanced, being quoted to-day £21 2s. 6d.

**Antimony.**—Cookson's is easier at 7.25c., while Hallett's has declined to 6.37½c., and other brands to 6c. to 6.25c.

**Nickel**—Is quoted at 40c. to 45c. for large quantities, and 50c. to 60c. in small lots.

**Quicksilver.**—The market continues at $47.50 for flasks of 76½ lbs. London cables £8 10s.

**Tin Plate.**—The market is quiet. The American Tin Plate Company quote $3.80 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, equivalent to $3.99, New York. English cables are 11 shillings 9 pence for Plates in Wales, showing an advance of 1½ pence.

## New York.

NEW YORK, August 26, 1903.

**Pig Iron.**—The local market has not yet felt the influences which have caused activity in other districts. Consumers along the seaboard are apparently waiting until the fact is firmly established that Southern Iron has touched bottom. That they are in need of stock is shown by their frequent purchases. Consumers who ordinarily buy in 500-ton quantities are ordering carload or 50-ton lots. This brings them in the market so frequently that the daily volume of business is averaging about the normal quantity for this season. If the Southern situation should develop strength in the near future it will undoubtedly cause many of the seaboard buyers to cover their requirements. Prices are unchanged, as the Northern furnace companies have for some time been selling on a parity with the quotations made by the Southern companies. We quote, at tidewater: No. 2 X Foundry, $16.50 to $17; No. 2 Plain Foundry, $16 to $16.50; Gray Forge, $15.50 to $16; Basic, $16 to $16.50. Tennessee and Alabama brands: $16.75 to $17 for No. 1, $16.25 to $16.75 for No. 2, and $15.75 to $16.25 for No. 3.

**Steel Rails.**—The only development during the week is the reported purchase of 50,000 tons for next year's delivery by the Baltimore & Ohio Railroad, of which it is stated that 28,000 tons were placed under contract with the Carnegie Steel Company, 12,000 tons with the Cambria Steel Company and 10,000 tons with the Maryland Steel Company. Prices are firmly held at $28 for Standard Rails and $32 to $34 for Light Rails.

**Cast Iron Pipe.**—Nothing of special interest has transpired. Quotations on carload lots are continued at $34 per gross ton, at tidewater, for 6 to 10 inch and $33 for 12-inch upward, these prices being shaded on large lots.

**Finished Iron and Steel.**—The Structural Material required for the terminal improvements of the New York Central Railroad in this city has been partly placed under contract. The quantity thus far ordered is 10,000 tons, divided between the leading interest and one or two other companies. The improvements may not be so large as at first contemplated, but additional quantities will be needed in the course of another month or two. While the immediate outlook does not cover much business of consequence, in either bridges or buildings, it is expected that the fall months will develop a great deal of tonnage. A careful canvass, which has been made by Structural companies in this city and in the West, encourages the opinion that at least as much business is in prospect as was the case at the same time last year. The postponement of a great deal of business by the labor troubles will result in greater activity when operations are actively resumed, and it is known that many new enterprises will be placed under contract. The Plate trade is moderately active in this locality, orders being fairly numerous, although seldom calling for large quantities. Mills are holding prices firmly. The Bar Iron trade is somewhat more active, but quotations are very irregular, and reports are current of some exceedingly low prices being made. In such cases, however, the question of quality necessarily comes up for consideration. We quote, at tidewater, as follows: Beams, Channels and Zees, 1.75c. to 2c.; Angles, 1.75c. to 2c.; Tees, 1.80c. to 2c.; Bulb Angles and Deck Beams, 1.90c. to 2.25c. Sheared Steel Plates, in carload lots, are 1.78c. to 1.85c. for Tank, 2c. to 2.10c. for Flange, 2.10c. to 2.20c. for Marine and 2.25c. upward for Fire Box. Refined Bars are 1.60c. to 1.80c.; Soft Steel Bars, 1.70c. to 1.80c.

**Old Material.**—Very few sales are reported. Occasionally a mill takes a small quantity of Wrought Scrap and now and then a foundry accepts a small lot of Cast. The rolling mills and Steel works, as well as the large foundries, are out of the market, and dealers report it difficult to get any offers whatever. The situation is even more discouraging than noted in previous reports. Collections are slow and one failure has occurred in the local trade as a result of the bad condition of business. Quotations are still nominal, but approximate figures are as follows, per gross ton, New York and vicinity:

| | |
|---|---|
| Old Iron Rails | $19.00 to $19.50 |
| Old Steel Rails, long lengths | 18.00 to 18.50 |
| Old Steel Rails, short lengths | 15.50 to 16.00 |
| Relaying Rails, heavy sections | 22.00 to 23.00 |
| Old Car Wheels | 17.00 to 18.00 |
| Old Iron Axles | 21.50 to 22.00 |
| Old Steel Car Axles | 19.00 to 20.00 |
| Heavy Melting Scrap | 15.50 to 16.00 |
| No. 1 Railroad Wrought Iron | 16.00 to 17.00 |
| Iron Track Scrap | 15.50 to 16.00 |
| Wrought Pipe | 11.50 to 12.00 |
| Ordinary Light Iron | 8.50 to 9.00 |
| Cast Borings | 6.00 to 7.00 |
| Wrought Turnings | 11.50 to 12.00 |
| No. 1 Machinery Cast | 15.00 to 15.50 |
| Stove Plate | 9.00 to 10.00 |

## Iron and Industrial Stocks.

The upward movement in the stock market, which promised so much to holders of stocks, culminated on August 21, and while prices did not seriously collapse, the recession was sufficiently great to cause a decided loss of confidence in a higher market. Since that time fluctuations have been within comparatively narrow range, although the tendency has been toward some improvement. The highest prices on active stocks reached on the 21st were as follows: Car & Foundry common 33½; Locomotive common, 18¾; Colorado Fuel & Iron, 53¼; Crucible common, 10½; Crucible preferred, 72½; Pressed Steel common, 43; Republic common, 11¾; Republic preferred, 65¾; Sloss-Sheffield common, 34; Tennessee Coal & Iron, 44½; Steel common, 23⅜; Steel preferred, 71⅞. Special influences have since operated to cause an exceptional advance in the case of some of the industrials. For instance, dividend talk on Can preferred caused an advance in that stock from 42½ to 44, and reports of an excellent showing soon to be made by the American Locomotive Company caused the common stock to advance from 18½ to 19¾. Following is the lowest price touched on the stocks named since Friday, with the price at noon on Wednesday of this week: Can preferred, 41¼ to 43½; Car & Foundry common, 32¼ to 32½; Colorado, 46 to 53; Steel common, 21½ to 23; Steel preferred 69½ to 70⅞.

Announcement is made that the plan to furnish the Consolidated Lake Superior Company with $12,000,000 of new working capital by an appeal to the stockholders to subscribe to an issue of 4 per cent. bonds at 60 has been abandoned. Only $3,000,000, or one-fourth of the contemplated loan, has been taken by stockholders. The time for receiving subscriptions, after having been once extended, expired on August 25. The directors, however, are not discouraged, but are emphatic in their declarations that in some way the money will be raised, attaching much importance to the assurances of friendly banking interests which, they say, have promised that they will not desert the enterprice. It is understood that the interest of F. H. Clergue, who promoted the company, has been purchased and that he is no longer connected with it in any way.

The statement is made, evidently on authority, that Charles M. Schwab, with C. H. Matthiessen, is now in control of the Chicago Pneumatic Tool Company. Mr. Schwab has obtained control of the company by the purchase of the holdings of Max Pam and his friends. The purchase, which places the absolute control of the property in the hands of Mr. Schwab and his friends, was in the nature of a settlement of the dispute which a few months ago threatened to impair the amicable management of the company. A dividend was then declared by the directors, but the payment was suspended indefinitely. Explanation was made that there had been disagreement on the part of the men who controlled the property on account of free stock which had

been issued to Mr. Pam and Mr. Schwab when the company were organized. An Arbitration Committee of the directors recently decided that Mr. Schwab and Mr. Pam should each pay $125,000 into the treasury of the company. Mr. Schwab, it is understood, bought from Mr. Pam about $800,000 par value of stock, paying for it $70 a share.

Chicago stockholders are reported to have received notice that no provisions have been made for payment of the semi-annual 4 per cent. dividend on Colorado Fuel & Iron, preferred, which was due August 21.

The Cramp Ship & Engine Building Company 5 per cent. collateral trust notes have been delivered to subscribers to the $5,000,000 loan through Drexel & Co. Subscribers get the notes at 90, with a bonus of 20 per cent. in stock. Before the subscription closed a small premium was bid in certain quarters.

The annual meeting of the Calumet & Hecla Mining Company was held in Boston on August 19. About a dozen shareholders were present. Vice-President Livermore presided. Last year's Board of Directors were re-elected, as follows: Alexander Agassiz of Newport, R. I.; Francis L. Higginson of Boston, Francis W. Hunnewell of Wellesley, Quincy A. Shaw, Jr., of Boston, James N. Wright of Detroit, Mich. The number of shares represented was 73,432. The acts of the Board of Directors for the year were formally approved and the annual report, recently issued, was accepted. The meeting was in session 15 minutes.

**Dividends.**—The directors of the Calumet & Hecla Mining Company have declared a dividend of $10 per share, payable September 24 to stockholders of record August 22. This is the third dividend declared this calendar year. $5 having been paid March 10 and $10 June 19, and brings total disbursements to stockholders up to $82,350,000 on a capital of $2,500,000. At the current prices of the stock the property is worth in the market about $45,000,000.

The National Lead Company have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable September 15. Books close August 28 and reopen September 16.

The Railway Steel Spring Company have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable September 21. Books close September 10 and reopen September 22.

## The New York Machinery Market.

NEW YORK, August 26, 1903.

There was a great deal of activity among local machinery merchants and well-known buyers during the last week, but the scene was "off the Hook" instead of the vicinity of Liberty street. There was little else than "yacht races" discussed in the machinery district on the off days, and on the days when the races were held the machinery houses might as well have been closed so that the clerks could see the races too. Some of the dignitaries of the big machine tool houses entertained their friends on private yachts, and among their guests were several big men would could better discuss certain important propositions that are hanging fire than the relative merits of 90-footers. Doubtless both subjects came in for some discussion. At any rate, the machinery men express hopes that the full five races will be required to decide the contest.

Actual business was very quiet. No extensive developments were reported in connection with any of the large projects which are now on the *tapis*. The General Electric machine tool list is about the most absorbing topic of Liberty street, so far as promised business is concerned. We understand that orders have been let for some of the big tools, such as Betts planers, but on the great bulk of the items no decision has been arrived at. John Riddell has been in town, but "just to see the yacht races." It is said that the list is constantly being increased, and that it is already so big and varied that the probabilities are rather in favor of the orders being divided up among numerous sellers.

Concerning the other large deals to which we have referred repeatedly, no new developments are to be notd.

We are in receipt of more complete details of the Pennsylvania Railroad project to erect new car shops at Altoona, Pa. It will be recalled that we have previously given this matter necessarily meager notice. The plans of the company provide for the construction of two additional steel car plants. The great demand for equipment and the inability of the outside manufacturers to deliver cars promptly has prompted the Pennsylvania officials to enter into the manufacture of steel cars on a much larger scale in order to supply their own necessities in the matter of equipment. It is also a move on the part of the Pennsylvania to eventually establish shops at which all the rolling stock of the system, including passenger and freight cars and locomotives of all descriptions, may be built. The company have now a large steel car plant under course of construction and it is said that the two additional ones will not likely be commenced before next spring. The estimated cost of the improvement at Altoona is over $1,000,000, and when completed will put the Pennsylvania in an independent position, so far as the manufacture of cars is concerned. The new plants will be modern in every detail and so equipped that it will be possible for the railroad company to build cars after patterns equally as good as those of the standard manufacturing plants throughout the country. Over $500,000 will be spent for each of the new plants, which includes up to date machinery and many improvements over the old shops that are necessary in turning out cars equipped with all the latest devices. The great demand for the steel cars and the inability of the company to get quick returns from outside concerns with which big orders are now pending has made the additional shops an absolute necessity. When the three plants have been put in operation the company will apportion the work in them. The new ones are to be used exclusively for the building of cars, both freight and passenger, while the third now being built will be devoted entirely to repair work. It is also said that the Pennsylvania officials have under advisement a number of changes in the pattern of the cars now used on the system, and with this object in view some special machinery is to be ordered for equipping the new works. All the cars built by the company have steel frames, which increase the life of the cars by several years and add materially to their capacity, and cost comparatively little more than the less durable ones.

Among the naval supplies required for the New York Navy Yard are pumps, conveyors and an exhaust system for handling shavings. Bids will be opened at the Bureau of Supplies and Accounts September 8.

A quantity of machine tools, a steel traveling tower and an overhead tramway system are included in the naval supplies for the Mare Island Yard, bids to be opened September 15.

Bids have been called by the Bureau of Supplies and Accounts for September 8 for furnishing the following machine tools at the Naval Academy, Annapolis, Md.:

Class 1. One full universal milling machine and one set of milling tools.

Class 2. One 26-inch stroke shaper.

Class 3. One metal planer.

Class 4. One 10-inch slotting machine.

Class 5. One single spindle electrically driven upright sensitive drill.

A radial drill is included in the list of supplies for the navy yard at Norfolk, Va., bids to be opened September 8.

The American Blower Company have been awarded the contract for the heating and ventilating apparatus to be installed in the new plant of the Pittsburgh Reduction Company at Massena Springs, N. Y.

Through E. D. Leeper & Co., manufacturers' agents for export, of New York and Mexico City, the Berger Mfg. Company of Canton, Ohio, recently shipped 22 carloads of galvanized iron sheets for the construction of barracks for the United States troops in the Philippines.

## A Lake Steamer to Hold 10,000 Tons.

At Cleveland on August 24, A. B. Wolvin of Duluth, Minn., and the general manager of the Pittsburgh Steamship Company, placed with the American Shipbuilding Company, for his private account, an order for the biggest steel steamer that has ever been contracted for on the lakes. She will be 560 feet over all, 540 feet keel, 56 feet beam and 32 feet molded depth. She will be 60 feet longer than the "Edenborn," now the biggest ship. She will have 33 hatches, each with a 12-foot center and arranged with a hopper bottom. This is done to give the automatic unloaders, now being generally installed on the lakes, a chance at the ore. The great difficulty with the clam shells when first introduced was that the deck beams and stanchions in the hold would not permit the jaws of the clam shells to expand and get the ore. When this was overcome in the construction of such ships as the "James Gayley," by the removal of the deck beams and stanchions that were in the way, it still was apparent that the ore piled itself in between the hatches and could not be removed without the aid of shovelers. The hopper bottom arrangement is intended to obviate that difficulty. With the "Gayley" it has been possible to unload upward of 90 per cent. of the ore from the hold automatically. It is believed that with the new steamer all of the ore can be lifted without the assistance of the shovelers.

The new steamer will come out before the opening of the season of navigation in 1904. She will have a carrying capacity of 10,000 gross tons of ore, with a draft of 8½ feet of water, the maximum now possible with the present channels on the lakes. She will have quadruple expansion engines, with cylinders 18½, 23½, 42½ and 66 inches, and with a 42-inch stroke. She will be built at Lorain, and will cost $500,000.

## Cincinnati Machinery Market.

CINCINNATI, OHIO, August 24, 1903.

In analyzing the conditions of trade for the months usually styled dull, the general opinion prevails that to a great extent this season has been an exception to the rule. While it is true that the volume of orders has materially decreased and inquiries are less frequent, yet, notwithstanding this fact, the various shops in this territory have, with possibly one or two exceptions, been working to their full capacity. This, of course, is attributable, in a large measure, to the already well filled order books, and manufacturers as a whole are glad for an opportunity in which to draw a fresh breath before the opening of the fall trade. Advantage is also being taken for general house cleaning, and the ornamental is being looked after in the shape of painting, both exterior and interior. The general opinion seems to prevail that business during the next few months will show a very decided increase, and that the year, taken as a whole, will eclipse that of 1902. The work of expansion is still on, and many manufacturers are directing their efforts toward increasing their output should occasion require.

Cincinnati will hold her annual Fall Festival commencing September 9, which it is hoped will stimulate trade, as all the railroads entering the city offer reduced rates for transportation, and it is anticipated that many prospective buyers will take advantage of these low rates and personally visit the different tool industries.

The trustees of the Public Library are advertising for bids for changing the method of suspension and setting of boilers and installing mechanical stokers in the Public Library Building, Vine street, in accordance with plans and specifications on file in the office of the Clerk of the Board of Trustees.

The Lunkenheimer Company have prepared plans and will commence the construction of an addition to their plant at North Fairmount. This extension will be 90 x 120 feet, and is to be used for storage and freight house purposes. Tracks will be run into the building, thereby greatly facilitating the handling of freight. The cost of this addition will be about $20,000.

The G. H. McGowan Pump Company report conditions unchanged, all of their departments being usually active. They are compelled to run nights in order to meet the requirements being made upon them. They have recently shipped a complete pumping outfit for the city of North Birmingham, Ala.

The Bickford Drill & Tool Company are working on orders booked some months since. The railroads, who for some time previous were heavy buyers, are holding off at the present, apparently waiting for conditions to settle. They anticipate that trade will receive a stimulus within the next month, and expect the year to be a very satisfactory one in all respects.

The John Steptoe Shaper Company's stock has within the last few weeks changed hands, and with this came a new official list. Alexander Dom is now president and O. H. Broxterman secretary and treasurer. The former officers still remain in the directory. They have no complaints to make of trade as they see it, and are busy filling orders.

The R. K. Le Blond Machine Tool Company say trade is exceptionally good for this season of the year, August of this year to date being far in excess of the same month in full last year. Especally does this seem to be true of their new milling machines, for which orders are being received from all portions of the country. They are now using their new warehouse, which greatly aids them in their shipping arrangements.

The Cincinnati Milling Machine Company have about completed their addition and expect to be occupying same by September 1. They have installed a new engine and generator and are now rearranging their tools to better advantage. Comparing the months of June, July and August this year with the same months in 1902, they say that 1903 is far in excess as to the volume of business handled.

Schumacher & Boye have their new office and warehouse building about ready for occupancy. This will give them well lighted and well ventilated office rooms, and be of great value in their handling of freight.

The Rahn-Mayer-Carpenter Company, manufacturers of lathes, have taken advantage of the temporary lull to renovate their shops. Trade with them at present is somewhat slack, but they are very hopeful for the future. The new warehouse which they have recently erected is 60 x 96 feet, and is a one-story, ironclad building. Inquiries are developing and September promises to open up in good shape.

The Cincinnati Machine Tool Company have commenced the foundation for their new shops. This building will be on Spring Grove avenue, nearly opposite the plant of Smith & Mills. They are extremely anxious to hurry the completion of this plant, as they need the extra room and equipment to take care of trade offering.

The Stewart Architectural Iron Works, mention of which was made in a previous issue, are contemplating adding very materially to their plant in Covington. At the time this statement was made the details had not all been arranged, and the news was possibly a little premature. They have also purchased a strip of ground to the east of their Cincinnati plant, which they will use for storage purposes.

The Pothoff & Frey Iron Company are very busy completing contracts under way. They are at work on the new B. & O. S. W. warehouse and office building, which is 48 x 500 feet. They also have the contract for iron work for the Bushnell Building at Springfield, Ohio, and for the Black-Clawson Company building at Hamilton, Ohio.

The L. Schreiber & Sons Company have all that they can attend to both at home and abroad. In addition to this they are erecting their new shops at Norwood, Ohio, which when completed will be one of the largest of its kind in the country. The plant will consist of foundry building, 115 x 450 feet; pattern shop, 80 x 125 feet, and a separate plant for power. They have contracted for the ornamental work on the First National Bank, the Ingalls Building and the Mercantile Library Building, all in this city, for the 14-story Fulton Building at Atlanta, Ga., the Stacey Mfg. Company, Hamilton, Ohio, and West Virginia Malleable Iron Company at Point Pleasant. This latter plant will consist of five steel buildings—viz.: Foundry, finishing, power, carpenter shop and pattern shop. They are also at work on the Wier Frog Company's building at Norwood, Ohio.

The change in the appearance of the I. & E. Greenwald Company's plant is quite pleasing. In addition to the rearrangement of the office they have freshened the exterior with a coat of paint and added some very attractive signs. They report trade all that can be desired, with inquiries for fall delivery numerous. They have secured the contracts for engines from the Cincinnati Milling Machine Tool Company, Cincinnati Planer Company and a 600 horse-power cross compound for the new plant of the Wier Frog Company.

The Bollman-Wilson Foundry Company are not so busy as they were last month, their plant at Norwood only running part of the time. They are now busily engaged on a large structural order of 15 carloads for a building in Dayton, Ohio.

The Blymyer Mfg. Company, while very busy, note a letting down somewhat in the way of orders. They have recently shipped for the United States Government's Agricultural Station at Waycross, Ga., an entire grinding outfit. The Government at this point is making experiments to show the feasibility of raising sugar cane in Georgia and Florida, the same as is now being done in Louisiana. Mexico trade continues good, and Porto Rico, being assured of her position in the United States, is gradually moving to the front.

The American Tool Works Company report a very satisfactory condition of trade. A short time since business began to fall off somewhat, the natural consequence of the summer season, but soon began to strengthen very materially. The inquiries now on hand are unusually strong, and indicate a heavy fall trade. Recently some large orders from the railroads have been received, and further business is expected from this quarter. Within the last few weeks they have made some nice export shipments and regard prospects for foreign trade as quite promising. Recent improvements in and about their works have increased facilities for rapid production. Their new tool, the American high speed lathe, is proving quite a trade catcher and meeting with great success wherever used.

Mention was made not long since that a company was being formed to carry on a new industry whereby tires could be placed on wheels while cold. The McGovern Tire Setter Company, with H. R. Irwin, president and treasurer; William Lodge, vice-president, and B. McGovern, secretary, are now in full operation, occupying a portion of the Lodge & Shipley plant on Colerain avenue. This is strictly a Cincinnati concern, and have good live people behind them. While this is possibly a new line of business, they feel that the machines that they are putting on the market passed the experimental stage some years since. From the trend of affairs in the vehicle business it appears that it will only be a short time before all manufacturers and repairers of vehicles will be compelled to adopt it. It not only does the work more accurately than can be accomplished by hand labor, but does it for a very small cost. This company feel that they are located in a good field, with excellent shipping facilities, with quite a number of their machines being owned and operated in some of the Cincinnati plants. They at present have a deal pending for the sale of a large number of their machines to go to foreign countries. Indications are that their present location will soon prove too small, and that they will be compelled to seek more commodious quarters elsewhere.

The Long & Allstatter Company of Hamilton, Ohio, report trade good, with fewer orders and inquiries being booked than for several months since. They are now finding time to catch up on contracts secured several months since, and are bending their energies in this direction. They have recently installed a large Detrick & Harvey open side planer as well as several smaller tools. They have secured contract for their tools for the naval stations at New Orleans, Boston, Portsmouth and Norfolk. They are also shipping one of their 30,000-pound steel shear machines to Jones & Laughlin Steel Company, Pittsburgh, Pa.

The Black-Clawson Company of Hamilton, Ohio, manufacturers of paper and pulp mill machinery, are having trouble in making deliveries within the time limit. They are now erecting a new foundry of brick and iron construction, 55 x 252 feet, which will cover the space occupied by the former building. In this they will install two 15-ton electric traveling cranes, one 60-inch cupola and other equipment complete. They will also construct a separate building for power purposes, in which will be installed a 300 horse-power Aultman & Taylor boiler and a 300 horse-power Corliss engine, direct connected to a 200-kw. Bullock generator. In addition to this they are perfecting plans for the erection of a pattern shop and office building, which will be 50 x 123 feet, two stories in hight, the office and drafting departments occupying the second floor. They have lately shipped one 86-inch paper machine complete for making box boards to Kokomo, Ind.; one 110-inch machine complete to the Tarentum Paper Mills, Tarentum, Pa.; one 72-inch paper machine complete for manufacturing box boards to Price Bros. & Co., Quebec, Can. They now have under construction one 98-inch and one 120-inch machine for Canadian points; one 68-inch and one 80-inch machine for Detroit, Mich.; one 68-inch machine for Modena, Pa., and one 124-inch machine for Rittman, Ohio.

The Hamilton Machine Tool Company have but recently moved into their new pattern and foundry building, which is 80 x 120 feet, and equipped with one large traveling crane. In connection with this they have erected a fire proof vault for the storing of their patterns. They report the month of July as the largest in their history, and that August is fully holding its own. They have just published a very handsome catalogue for their trade, which to say the least is very suggestive as to the enterprise of the Hamiltonians, as it is all of home manufacture. The tools that made the engine and paper mill, the engine that drove the presses and made the paper, the cuts, the printing and the binding, all Hamilton products.

There has recently been erected in Hamilton a new plant known as the Hamilton Metal Pattern Company. This foundry is 32 x 165 feet, running into an "L," 46 x 82 feet. They manufacture all kinds of wood and metal patterns and are very busy at present.

The Hooven-Owens-Rentschler Company, known as the Hamilton Corliss Engine Works, report an excellent business with no let up in sight. Their new offices are very spacious, well lighted and handsomely appointed, the finish being of mahogany and presenting an elegant appearance. Their new plant is now in full operation, and judging from the number of engines under construction at the present time the outlook for continued trade is very bright. Among the recent shipments which they have made we note a 20 x 40 x 42 heavy duty cross compound D. C., 500 kw., for Macon Railway & Light Company, Macon, Ga.; a 20 x 40 x 42 heavy duty cross compound D. C., 400 kw., for G. H. Hammond Company, Chicago, Ill.; a 22 x 44 x 42 heavy duty cross compound D. C., 650 kw., for Little Rock Traction & Electric Company, Little Rock, Ark.; a 20 x 40 x 48 cross compound for Central Felt & Paper Company, Manhattan, N. Y.; two 26 x 52 x 48 heavy duty cross compound, 1000 kw., for Scioto Valley Traction Company, Columbus, Ohio; 18 x 36 x 48 heavy duty cross compound, 500 kw., and a 14 x 26 x 36, 200 kw., for Fox River Light, Heat & Power Company, Aurora, Ill.; a 22 x 42 x 48 cross compound for Winnebago Traction Company, Oshkosh, Wis.; two 30 x 60 x 60 heavy duty cross compound, 1500 kw., for Washington, Baltimore & Annapolis Electric Railway Company, Washington, D. C.; a 14 x 22 x 42 and a 16 x 32 x 42 cross compound for the Lafayette Box Board Company, Lafayette, Ind.; a 20 x 40 x 48 cross compound for Omaha & Council Bluffs Railway & Bridge Company, Council Bluffs, Iowa; a 20 x 32 x 42 heavy duty tandem compound, 500 kw., and a 12 x 18 x 36 tandem compound, 150 kw., for the Fort Wayne Electrical Works, Fort Wayne, Ind.

The Niles Tool Works are as busy as usual. Inquiries for fall trade are developing and prospects for future business are good. They recently raised the roof of their shop 10 feet, in order to permit the installing of two 10-ton electric traveling cranes. In their yard across the street they are erecting a 20-ton electric traveling crane for handling of shipments. They are also constructing a new brick and wood warehouse, 60 x 150 feet, which will contain all modern equipments. They recently had a large consignment of tools for the United States Navy Yard at New Orleans.

## The Iron Ores of Arctic Lapland.*

BY CHASE S. OSBORN, SAULT STE. MARIE, MICH.

The greatest iron ore fields in Swedish Lapland are beyond the Arctic Circle. The best known of these fields are Gellivare, Kiirunavaara and Luossavaara. The first mentioned has been sending out ore since 1888. The Luossavaara deposit has not yet been attacked by modern operations. The Kiirunavaara is being wrought, and the first train of ore was dispatched November 15, 1902.

The railroad from Kiirunavaara to the new iron ore shipping port of Narvik, on Lofoten Fjord, was not entirely completed and opened for regular traffic until July 15 of this year. It is the furthest north of any railroad in the world. The ore docks at Narvik will probably not be completed this year, perhaps not entirely so until late next season, for they are of cement foundations and superstructure of steel. Narvik is an open port the year round and is a rail haul of 105 miles from Kiruna, the mine station.

The Gellivare mines, of which the most important is the Tingvallskulle mine, are 125 miles by rail from Lulea, at the head of the Gulf of Bothnia, which port is only open on an average of about five months of the year. These mines are 166 miles from Narvik, but the grades that way are very bad.

At Lulea the company have an electric concentrating or magnetic separating plant, where in 1902 130,000 tons of 40 per cent. ore was enriched to 71 per cent. The lean ore is crushed to a diameter of 1 mm. American Monarch crushers are used. The actual cost of separation is stated at 20 cents a ton. The total cost of producing the concentrated ore is stated as varying from 8 to 10 kroners —a kroner is about 26 cents. Steam power is now used, but water will be.

The ore body at the Tingvallskulle mine, Gellivare district, varies from 40 to 110 m. in width, and has been worked to a depth of 73 m. There are 14 m. of stripping. The Gellivare Company own 1450 acres of mining land. The management of the company states that if the ore extends to a depth of 300 feet it is safe to estimate 60,000,000 tons.

The production of the Gellivare district as given by years up to 1903 is as follows, making a total of 8,088,711 tons:

| | Tons. | | Tons. |
|---|---|---|---|
| 1888 | 70,622 | 1896 | 604,520 |
| 1889 | 34,816 | 1897 | 623,109 |
| 1890 | 27,520 | 1898 | 851,277 |
| 1891 | 450,000 | 1899 | 841,873 |
| 1892 | 178,615 | 1900 | 866,835 |
| 1893 | 296,436 | 1901 | 985,256 |
| 1894 | 655,401 | 1902 | 977,744 |
| 1895 | 624,688 | | |

In April last the Gellivare Company had 1500 men employed. The mining was all being done by hand drilling. The average price paid per eight-hour shift for common labor at these mines is 78 cents and for miners $1.30. The management states the gross cost of putting the ore on the cars, including interest, renewals and everything, to be about 81 cents.

Most of this ore is shipped to Rotterdam, although some has found its way to Stettin and to English ports. From Rotterdam and Stettin it has principally gone to the Krupp works at Essen. Gellivare ores are transported in steel cars carrying 25 tons each. The ore rate from Gellivare to Lulea, 125 miles, is 70 cents a ton. The low phosphorus ores from Gellivare are principally sold in England. Five grades of ore are mined at Gellivare. "A" ore must be below 0.040 in phosphorus and up to 68 per cent. metallic iron; "B" ore is between 0.040 and 0.100 phosphorus and 68 per cent. iron; "C" ore is between 0.100 and 0.800 phosphorus and 65 per cent. iron; "D" ore is between 0.800 and 1.25 phosphorus and 63 per cent. iron. "E" ore is all that goes above 1.25 phosphorus and is guaranteed at 61 per cent. iron. This ore contains one-quarter to one-half of 1 per cent. of titanium and is rather high in sulphur, but no complaints are made on either score, the management

* Abstract of paper read at the annual meeting of the Lake Superior Mining Institute.

states. The management at Gellivare also stated that the tendency of sulphur was to decrease with depth. The surrounding rock is granite, associated with which is a gray hornblendic rock.

Gellivare is within the Arctic Circle, and so far north that electric light plants are closed down from May 10 to August 10 and mining work is continued throughout the 24 hours during that period by sunlight.

The properties at Gellivare and Kiirunavaara that are being operated are owned by the same company, the majority of the stock in which is held, unless a transfer has recently occurred to the Grangesberg Iron Company, by G. E. Broms of Stockholm. In fact, Mr. Broms holds, or did hold, over 90 per cent. of the stock. In April, 1903, he had given an option to the Grangesberg Iron Company, and it is reported that it has since been closed and the properties transferred to that company. By the terms of that option Mr. Broms was to receive a cash payment of $2,314,000, and a royalty of about 2½ cents per ton upon all ores shipped from both Lulea and Narvik for 50 years, and the reported terms of the option required a minimum production of 2,000,000 metric tons a year. In addition to this, the Grangesberg Iron Company were to assume all indebtedness. This amount was not stated, but an index was the fact that the Grangesberg Iron Company had applied to the Swedish Government for a loan of $5,200,000, at 4 per cent. interest, for the purpose of financing the proposed deal. It has been reported by good authority that the Government made the loan.

The railroad from Lulea, at the head of the Gulf of Bothnia, to Narvik, on the Arctic Norwegian coast, is owned by the Governments of Norway and Sweden. The Swedish Government owns from Lulea to Riksgransen and the Norwegian Government from Riksgransen to Narvik. From Riksgransen (or people's boundary) to Narvik, on the Norwegian portion of the line, the great Arctic divide is crossed, requiring huge rock cuts, 23 tunnels in 24 miles. It is one of the finest pieces of governmental accomplishment in the world. In April, 1903, the trains carried snowplows ahead and flangers behind, and the snow was 10 feet deep. It was banked up higher than the cars on either side of the railroad.

The Kiruna ore is shipped in 35-ton steel cars, 20 of which are drawn by a 125-ton engine. This will be an indication of the heavy grades, as that would be only 700 net tons per train. The ore rate from Kiruna to Narvik is to amount to sufficient to pay the interest on the railroad, plus the actual cost to the Government of transporting the ore. In April the Kiruna mines were sending out 60,000 tons a month, and proposed to increase to 100,000 tons as soon as transportation facilities would permit. On April 18, 1903, the Kiruna mines sent out 3700 tons.

Kiruna Mountain is more than 700 feet above the level of the surrounding country, and the ore outcrops at the top. The ore body has been opened by a drift at the base of the mountain 500 m. long, 320 m. of which are in ore, and the ore has been cross cut at one place from this drift without finding either wall for 120 m. The ore body varies in width from 300 to 700 feet. It is known that the ore body in the Kiirunavaara Mountain has an unbroken surface length of 3500 m. The ore then dips under Luossajarvi Lake, and outcrops beyond in Luossavaara Mountain at a hight of over 600 feet. Drilling on the ice during the past winter proved that the ore continues under Luossajarvi Lake, and it is believed to be continuous and unbroken from Kiirunavaara to Luossavaara, a distance of over 5 miles.

The ore body in the Kiirunavaara Mountain has been attacked in benches or levels; the first bench 100 feet above the drift at the base of the mountain, the second 200 feet, and so on 100 feet apart to the top of the mountain. These levels are connected with the drift at the base of the mountain by mills, and the milling system of mining is used. The ore cars run by gravity to the loading pockets, and are there dumped automatically. The cost of mining and loading the ore on the cars is stated at 40 cents a ton. Power drills are used at Kiirunavaara, and a force of 400 men was employed in April, 1903. The wages varied from 92 cents to $1.56 a day. Drill men were paid $1.56; loaders, $1.30, and laborers, 92 cents to $1.04 for eight hours.

Kiruna ore also goes to Stettin and Rotterdam, and some of it to England, and at least one cargo was shipped to Sydney, Canada. The Sydney people state that the Kiirunavaara management offered to trade ore for coal, ton for ton. All coal used here is obtained in England, and the fuel cost is high. The price of the best Kiruna ore at Narvik, 1903, is 9½ shillings. The water freight rate, Narvik to Rotterdam, for 1903 is 5½ shillings. The selling price of this ore at Rotterdam in April, 1903, was given at $3.64.

Dr. Hjalmar Lundbohm is in charge of the Kiirunavaara mine. While chief geologist of Sweden, he made for the Swedish Government an examination and report on the properties at Kiirunavaara and Luossavaara that led to the extension of the Arctic railroad from Gellivare to Narvik.

It is claimed that the Kiirunavaara and Luossavaara ore fields are the most extensive of their character of ore in the world that are capable of being economically reached by transportation facilities. The ore is a magnetite, and is found in granite. It runs as high as 70 per cent. in metallic iron, and they claim to have no difficulty in shipping cargoes of 67 per cent. It contains as high as 2 per cent. phosphorus, and often more than 1 per cent. of titanium.

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In the report of the Interstate Commerce Commission appears an interesting comparison of the density of the freight and passenger traffic on the railroads of the United States during the past 12 years, which furnishes a valuable side light on the question of the necessity existing for the continuous increase in rolling stock and other equipment, which the railroads have found it necessary to provide. In 1891 the number of ton miles of freight per mile of line was 502,705; by 1898 this figure had become 617,810, and in 1902 it was 793,351. In the same way the passenger density increased from 79,642 in 1891 to 99,314 in 1902. Both quantities showed periods of "ups and downs," but since 1897 the figures have been on a steady increase, the percentage of advance since that date being 53 for freight and 48 for passenger traffic.

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The largest factory of chemicals in the world is said to be the aniline and soda establishment of Baden, in Ludwigshaven-am-Rhein. The works employ 148 scientific chemists, 75 technical engineers, 305 clerks and more than 6000 workmen. There are 421 buildings for factory purposes, 548 dwellings for laborers and 91 for officials, and 102 boilers furnish steam for 253 engines, of an aggregate of 12,160 horse-power. Gas is extensively used as a fuel. A ship, owned by the establishment, and used for the transportation of sulphuric acid, has a capacity of 600 tons. A private railway of 27 miles length, on which 387 cars are operated, connects with the State railroad system.

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In view of the difficulty experienced by the British Admiralty in the storage of coal for the navy by the ordinary wharfing, whereby the fuel deteriorates, some important experiments are being made to test the truth of the theory that when coal is submerged under water its calorific value is preserved. For this purpose five large wooden cases, filled each with 2 tons of fresh Welsh coal, have been sunk to a considerable depth in Portsmouth Harbor, where they are to remain for a year. A similar quantity has been stored upon the land in the orthodox manner. At the expiration of the time stated the submerged coal will be raised and will be tested in parallel with the coal which has been stored upon the dry land, in order to determine the points at issue.

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The final account of the administrators of the estate of the late A. M. Byers of Pittsburgh showed assets on hand at Mattie Furnace of Girard Iron Company, in which Mr. Byers owned a controlling interest, of $891,146, and that the profits of this furnace from April 1, 1902, to June 1, 1903, were $501,279.

# HARDWARE.

A PROBLEM which generally confronts those who are in charge of the interests of associations of any kind is the extension of the membership as persons for whom the organization is intended are brought into active identification with it. This is certainly the case in retail Hardware organization work. The fact that about 4000 Hardware houses are represented in the movement which is charged with looking after the interests of retail merchants is an evidence of the energy with which the growth of the movement has been fostered. That there is an opportunity for more work along the same lines is seen in the large number of houses of all grades which still hold aloof from the associations with which they might properly be identified. There is certainly plenty of opportunity for aggressive work in making the movement more thoroughly representative and therefore more influential in promoting the interests of the trade.

Imperative as is the call for increase in the membership of these associations, there is more reason for insisting on the desirability, perhaps we should say the necessity, of securing the constant interest of the members in association work and utilizing their co-operation in carrying it on. Up to this time the organized activities of the ordinary State association have been limited largely to the holding of an annual meeting, at which, indeed, there was an attractive programme with usually a good attendance of the membership. After the adjournment of what was presumably a stimulating and profitable meeting there has been little to remind the merchant of his identification with the association, except perhaps a bill for dues and the notice of another annual gathering. It is not strange that some lose interest in the association movement. The fact that so many retain their membership is an evidence of the strength of their attachment to the association and their recognition of the good which, with all their limitations, retail Hardware organizations are accomplishing. There is, however, an imperative necessity for association activities between meetings.

How this desirable end is to be attained is, however, not an easy question. The answer will depend largely on the special circumstances in each association and the ingenuity, energy and enthusiasm of those in charge of its interests. The work of the association should be so organized and its methods of working so devised that the merchant, whether in the stir and pressure of an important town or in the comparative seclusion of a store widely separated from the great currents of commercial life, shall realize that he is connected with an active organization and is doing something to aid it in carrying out its plans for the improvement of trade conditions. There are so many things that come properly within the scope of such an association that there are many lines on which its activities can be conducted and the co-operation of its membership elicited. Information is needed in regard to the interferences, whether by jobbers, manufacturers, catalogue houses, department stores or in other ways, with the regular course of things, and this information should be made as definite as possible that those in charge of the interests of the association may be able to take a broad and intelligent view of the situation. There are always questions under advisement in every live organization on which the information of the membership would be of value. There is a great need of something in the way of concert of understanding or action between merchants competing in the same town or larger territory. There should be plans under way, in the carrying out of which the membership of the association might help. New members are needed and machinery might be set in operation to secure them. Outings or sectional gatherings of some kind are found to be very useful by some associations. The work of the National Association will naturally bring to the attention of the various State associations matters in which co-operation will be of service to the common cause. There are many matters, such as those connected, for example, with freights, arrangement of list prices and discounts, differentials between various classes of trade, which are of vital importance to retail merchants and afford a field for useful association inquiry and effort. The field is, indeed, so large and interesting that there is abundant opportunity for activities which will make the members realize that they are connected with a live organization which is working practically for the betterment of the trade. If in addition to having methods which keep the member reminded of his identification with the association, and in connection with which he can help in its work, means can be devised to make the association a direct and practical help in business it will be a great gain. The movement is in such an interesting stage and has reached such a position of attainment and promise that questions concerning the lines on which it is to be directed deserve the best consideration of all broadminded and progressive Hardware merchants.

## Condition of Trade.

The demand which is coming in to manufacturers gives evidence of the quickening of business throughout the country and the desire on the part of merchants to be in good shape for the fall trade. There is certainly a more confident tone in regard to business to be found in many circles, where up to a short time ago there was a disposition to question as to the character of the trade during the remainder of the year. Orders coming in are well assorted as a rule, and cover goods needed to supply the demands of business in the near future, there being little disposition unnecessarily to anticipate inquiries. The impression is very general that business for the next few months will be of at least good volume. The steadiness of the market in the matter of prices is a gratifying feature of the situation. Most Hardware lines are firm and well maintained, with but slight concessions here and there. A few lines, such as Carriage Bolts, Machine Bolts, Nuts, &c., are weak and uneven, as well as some of the heavier products which feel immediately the decline in the price of Iron. A gratifying feature of the trade is the fact that in spite of the condition of the market for raw material prices of the finished goods are so steady and the feeling of the trade so hopeful for fall business. To this feeling the very satisfactory reports in regard to the crops in general, the heavy volume of business which is being done by the railroads and the general prosperity throughout the country contribute.

### Chicago.

*(By Telegraph.)*

A decided improvement has been noted in the demand for the fall shipment of Wire and Nails during the past week, and the requests to anticipate early shipments of contracts continue frequent and urgent. The demand for Wire Fencing has been especially active, and supplementary orders for Baling Wire, for the large hay crop, have been pressing. Manufacturers report that they are already way behind in their orders, and it is difficult for jobbers to secure additional supplies promptly. The indications of the growing shortage of cars, and hence the difficulty in getting prompt shipments of coke, are being felt

by the mills, and although there is no scarcity of steel, there is difficulty in getting the manufactured product forward. A few manufacturers of Shafting, Structural Shapes and other lines of Heavy Hardware note some little increase in business, but as a rule the general market is dull with a drooping tendency, which does not increase business. Wrought Washers and Chain have been especially dull and heavy, and some little cutting in prices on Bolts and Nuts has been indulged in, but as a rule this has been more by second hands, manufacturers being less ready to meet competition by any material reduction of prices. Stove manufacturers are placing important contracts for the season's requirements of Stove Bolts and Rivets, and Agricultural Implement manufacturers have also been free buyers of Bolts, Nuts, Rivets and Screws, and business is expected to increase materially. Manufacturers and jobbers, however, note that there is still a very light trade for Tire Bolts, this season's experience being similar in this respect to a year ago, both seasons being unusually wet, there being unusually little business in the resetting of Tires. It is notable, however, that both carriage and wagon manufacturers have been in the market for Spring and Tire Steel, indicating a revival in that industry, which has been extremely quiet for some time past. The most important feature in the Builders' Hardware line is the active competition for business, which has resulted in no little cutting of prices, even the association members not being held strictly in line, because of the loss of a good many contracts to outside concerns. Some important contracts are being figured upon at the present time, but new business of the week has been light. If the estimates for Structural Material for 1904 delivery prove to be anywhere near the actual business transacted, manufacturers of Builders' Hardware cannot fail to have an active business next year, and the fall trade of this year will doubtless show quite an improvement over the last two months. Considerable weakness is noted in Wrought Steel Butts, however, keen competition being responsible for concessions by various manufacturers. Manufacturers' agents of general jobbing lines of Hardware report the market still extremely quiet, although some little improvement has been noted in the movements of a few special lines. Kitchen Utensils and Enameled Ware have also been among favored lines. It is reported that prices on Galvanized Ware, especially Pails, Tubs and Baskets, will be advanced materially on September 1, an understanding having been recently reached by four of the largest manufacturers of these goods. There has been a fair inquiry for Chisels, Hatchets and especially an increase in the demand for Axes during the week. Jobbers report an improved movement in shipment of fall lines, such as referred to a week ago. Several firms in Chicago, who have heretofore carried only special lines of Household Furnishing Goods, Carriages, Buggies, Harness, Bicycles, &c., have decided to enlarge by carrying a general line of Hardware, and purchases on this account have been made from manufacturers' agents in this section, which has given some life to trade. Some manufacturers of Bristle Goods have advanced prices from 5 to 10 per cent., and this advancing tendency naturally stimulated the demand before the higher prices went into effect.

### St. Louis.

*(By Telegraph.)*

Orders for fall stock are on the increase, and a liberal call is coming for such items as Ammunition, Lanterns, Elbows, Coal Hods, Stove Boards, &c., as well as for seasonable lines. Our jobbers are thoroughly alive to the possibilities of trade in the Western and Southwestern country and are continually augmenting their traveling forces in territory where it seems to warrant. The local railroad facilities for handling shipments have been a source of complaint for some time, but now more influence and pressure than ever before are being brought to the front, and it is to be hoped that affairs in this most vital and important direction will be improved. Trade in heavy lines is reported ahead of last year at this season, and although complaint on the score of collections is heard in some quarters, most accounts are being met with reasonable promptness.

## NOTES ON PRICES.

**Wire Nails.**—The improvement in demand is small, but indicates a larger volume of business in the near future. The price of billets and rods having been fixed, there appears to be no reason why the price of Nails should be changed. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

| | |
|---|---|
| Jobbers, carload lots | $2.00 |
| Retailers, carload lots | 2.05 |
| Retailers, less than carload lots | 2.15 |

*New York.*—Business in the local market continues in about the same volume as for some time past. The market is firm at the following quotations: Single carloads, $2.20; small lots from store, $2.25 to $2.30.

*Chicago, by Telegraph.*—Manufacturers report the early placing of some important contracts for fall delivery for assorted sizes and an urgency for early shipment. While stocks have accumulated cars seem to be none too plentiful to make prompt shipments. The tone of the market is firm and the prospect seems that prices will be well maintained throughout the year. Sales continue to be made at $2.15 to $2.20 for carload lots, f.o.b. Chicago. Broken cars sell at 5 to 10 cents higher. For galvanizing 75 cents per keg and for tinning $1.50 extra per keg is charged.

*St. Louis, by Telegraph.*—A good volume of demand prevails and jobbers' quotation in small lots from store is $2.35.

*Pittsburgh.*—There is a fair demand for Wire Nails considering the season of the year, and the tone of the market is firm. A large increase in orders is expected early in September, when fall trade usually opens up. We quote $2 in carloads to jobbers, $2.05 in carloads to retailers, and $2.15 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days. For galvanizing Nails 75 cents per keg is charged and for tinning Nails $1.50 per keg extra.

**Cut Nails.**—A meeting of the Cut Nail Association is scheduled to be held on August 27, but at the present writing it is impossible to forecast what action may be taken. The demand continues moderate for small lots. Quotations are as follows: $2.15, base, in carloads, and $2.20 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms, 60 days, less 2 per cent. off in 10 days.

*New York.*—The local demand is restricted to the requirements of the trade, which are moderate under existing suspension of building operations. Quotations for carloads and less than carloads are as follows: Carloads on dock, $2.29; less than carloads on dock, $2.33; small lots from store, $2.40.

*Chicago, by Telegraph.*—While there has been no improvement in the demand, there has been less disposition to shade prices by the jobbers and the mills preserve a firm tone, sales being made on the basis of $2.30 in carload lots and $2.35 for less than carload lots for Steel, Chicago. Iron Nails are held at $2.45 to $2.50 per keg from store.

*St. Louis, by Telegraph.*—A moderate volume of business is the general report in this department of the market. In small lots jobbers quote Steel at $2.40 and Iron at $2.55.

*Pittsburgh.*—Demand is only fair, but prices are being fairly well maintained. The mills have large stocks and ship out promptly on receipt of order. We quote: Steel Cut Nails, $2.15, base, in carloads and $2.20 in less than carloads; Iron Cut Nails, $2.25, base, in carloads and $2.30 in less than carloads, plus freight in Tube Rate Book to point of destination, 60 days, less 2 per cent. off in 10 days.

**Barb Wire.**—An improvement in demand is noticeable, but as yet does not increase the volume of business to any great extent. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

| | Painted. | Galv. |
|---|---|---|
| Jobbers, carload lots | $2.30 | $2.60 |
| Retailers, carload lots | 2.35 | 2.65 |
| Retailers, less than carload lots | 2.45 | 2.75 |

*Chicago, by Telegraph.*—The new tonnage being placed has shown some improvement over previous weeks, and larger shipments are coming forward from the mills in response to an urgent demand from the trade. The tone of the market continues firm. Galvanized Wire is selling on the basis of $2.75 to $2.80 in carload lots, and Painted at $2.45 to $2.50, the outside price being to retailers. For small lots 5 to 10 cents extra is charged. Staples in carload lots sell as follows: Polished, $2.30 to $2.35, and Galvanized, $2.70 to $2.75, the outside price being to retailers.

*St. Louis, by Telegraph.*—Improvement is said to continue, and the demand upon the jobbers is in good volume. Quotations for small lots from store are as follows: Painted, $2.65; Galvanized, $2.95.

*Pittsburgh.*—Very little new business is being entered by the mills, but they are accumulating large stocks, in the belief they will need them for fall trade. Prices are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent discount for cash in 10 days: Painted, $2.30; Galvanized, $2.60, in carloads to jobbers; Painted, $2.35; Galvanized, $2.65, in carloads to retailers; Painted, $2.45; Galvanized, $2.75, in small lots to retailers.

**Smooth Fence Wire.**—Contracts are being placed by some of the large consumers in the West, and demand is generally somewhat beyond expectations. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

| | |
|---|---|
| Jobbers, carloads | $1.90 |
| Retailers, carloads | 1.95 |
| Less than carloads | 2.05 |

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

| | 6 to 9 | 10 | 11 | 12&12½ | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|
| Annealed | Base. | $0.05 | .10 | .15 | .25 | .35 | .45 | .55 |
| Galvanized | $0.30 | .35 | .40 | .45 | .55 | .65 | 1.05 | 1.15 |

*Chicago, by Telegraph.*—Both Wire and Wire Fencing have met a more active demand, and the mills find some difficulty in making shipments promptly, the market continuing firm in tone for all kinds, prices being as follows: Nos. 6 to 9, $2.05 to $2.10 in carload lots on track, and $2.15 to $2.20 in less than carload lots from store; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

*St. Louis, by Telegraph.*—The volume of trade remains steady, and jobbers quote No. 9 at $2.35 and Galvanized at $2.65.

*Pittsburgh.*—Demand has fallen off very much recently and is confined to small lots only. Prices are fairly firm, and we quote: Plain Wire, $1.90, base, for Nos. 6 to 9 in carloads to jobbers, $1.95 in carloads to retailers and $2.05 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

**Shot.**—The Shot market is firm and more regular than sometimes. Manufacturers are showing an unwillingness to give the quantity price even to the jobbing trade unless the requisite quantity is covered by the order.

**Bolts and Nuts.**—The market for Carriage Bolts, Machine Bolts and Nuts is in a less satisfactory condition, so far as prices are concerned, than almost anything else in the Hardware field. In view of the unevenness in manufacturers' quotations an opportunity is given to buyers for careful purchasing. The irregularity of discounts is such as to leave the market practically, if not actually, an open one. This branch of the trade is feeling the effect of a moderate volume of business, especially when compared with the very heavy business of the past few years. With the increase in production and the diminished demand, for the present at least, there is a natural reaction. The trade, in view of the unsettled condition of things, have very generally been holding off and deferring their purchases. It is possible, however, that the low prices now obtainable may tempt them to place orders.

**Scythes.**—The manufacturers of Scythes have reached an understanding in regard to prices for next season, which are substantially the same as those for the season just past. They regard the condition, so far as prices are concerned, as satisfactory, especially as until quite recently there was a possibility that they would fail to act in concert so far as quotations are concerned.

**Axles.**—The manufacturers of Wagon and Carriage Axles are announcing somewhat advanced prices as the result of an agreement which has been reached by the principal producers. It is understood that the arrangement which exists between them is a strong one and that the prices determined upon will be maintained.

**Cordage.**—The demand for Sisal Rope in this market is largely for mixed goods, orders for which are received in good volume. There is a fair call for Manila Rope. Quotations, on the basis of 7-16 inch diameter and larger, are as follows: Mixed Sisal, 8¼ to 8½ cents per pound; Pure Sisal, 9¼ to 9½ cents per pound; Manila, 11½ to 11¾ cents per pound.

**Glass.**—Local demand has not improved during the week, nor have irregular quotations entirely disappeared. There are indications that a marked improvement in demand and market conditions are probable when labor troubles are over and buildings which are in course of construction can be completed. The Jobbers' Association's local quotations are as follows: In small lots, 90 and 5 per cent. discount for the first three brackets and 90 and 15 per cent. discount for all sizes above, either single or double strength.

**Oils.**—*Linseed Oil.*—A stronger seed market has again caused a firmer feeling among crushers, and some out of town crushers have withdrawn former quotations and are now asking 36 cents for Raw. Other out of town crushers are quoting 35 cents per gallon. Demand for city and out of town Oil is light and is confined to immediate requirements. Quotations are as follows: City Raw, in lots of five barrels or more, 37 cents; in lots of less than five barrels, 38 cents per gallon. Out of town brands of Raw are quoted, according to quantity, at 35 to 36 cents per gallon.

**Spirits Turpentine.**—The strength of the market, as reported last week, continues, owing to the strong feeling at Savannah. Sellers and buyers appear equally indifferent, and business is confined to pressing requirements. Quotations, according to quantity, are as follows: Oil barrels, 57½ to 58 cents; machine made barrels, 58 to 58½ cents per gallon.

## HOLIDAY TRADE.

IT is not too early for merchants who make a feature of Christmas trade to begin preparations, not only by placing orders for holiday goods, but also getting cuts and arranging for special advertising.

### Advantages.

By making purchases of special holiday goods early, there is an unbroken assortment to choose from, and early shipment avoids disappointment in receiving goods, while it permits arranging them in an attractive manner for the earliest customers.

### Regular Stock.

Many articles for which there is a sale throughout the year, in an enlarged assortment and more elaborate styles, are made especially attractive as holiday presents when surrounded by green and pervaded by the atmosphere of Christmas.

### An Early Start.

There is not much inspiration, it is true, to get up Christmas advertising during the hot days of summer, but procrastination will prove the thief of time in this particular, as in others. Delay in obtaining cuts, activity of fall business and dilatory tactics on the part of the printer, &c., are apt to leave the merchant insufficient time to carry out his plans with satisfaction to himself.

### Booklets.

Many merchants have found it profitable to get out booklets, more or less elaborate, and distribute them by mail, or otherwise, to every family in their respective

towns by the first of December. This they do in addition to newspaper advertising.

### Awakening Interest.

Calling the attention of the public thus early to the fact that much attention is to be given to holiday trade, with suggestions as to suitable articles for gifts, will largely increase business in this direction. The public may be invited to come while the assortment is unbroken, before the rush, and make their selections, assuring them that goods purchased will be set aside for them, and delivered when requested.

# Letters From the Trade.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

### Business Outlook in Indiana.

We are indebted to a well-known house in Indiana for the following advices in regard to the future outlook for trade in their territory:

The crops in this section of Indiana are, we should say, about an average. Hay was unusually heavy and fine, and was harvested in prime condition. Wheat and oats much lighter than last year, but of fine quality. Corn is promising very well after passing through the hardest conditions for years. It looks like our farmers will enjoy on the whole a very prosperous year, as prices are fair and demand is unlimited. We never saw anything like the improvements going on everywhere in the country—new barns in sight everywhere and substantial improvements of all kinds going on. Labor fully employed and very hard to obtain, and from the amount of unfinished work in sight labor will be fully employed until winter. We are benefited to some extent by the proximity of the oil field. The oil industry is very prosperous at present and developments are encouraging, and our farmers are reaping benefits that are substantial and increasing. We believe we shall have a fine fall trade in Shelf Hardware and Stoves, but not so much in Farming Tools, as there is a disposition to taper off in that line. We find an increasing demand for Gasoline Engines and Wind Pumps, and are expecting a larger fall trade in Wire Fencing than ever before.

### The Church Bell.

Touching on the Church Bell incident, which has been fully discussed in former issues, a prominent Hardware dealer of Monticello, N. Y., remarks that the local retail dealer should have furnished the Bell at cost, and given at least $5 to the church toward the purchase of the Bell. He expresses the opinion that no merchant should expect to get a margin on a Bell sold to a church.

## REQUESTS FOR CATALOGUES, &c.

*The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses:*

From L. P. Rogers Hardware Company, Glasgow, Ky., who have just opened up a store for the sale of Shelf and Heavy Hardware, Stoves, Tinware, Queensware and House Furnishing Goods. Mr. Rogers has had considerable Hardware experience, having been with W. B. Belknap & Co. of Louisville for the past ten years.

The co-partnership formerly existing under the name of John J. Harllee & Co., Boston Building, Denver, Col., has just been dissolved. Mr. Tooke has retired, and John J. Harllee will continue the manufacturers' agency business under the same style and at the same address.

## DISPLAYS IN THE HARDWARE WINDOW.

BY EDWARD D. WARNER.

PROMINENT among the essentials of a properly conducted and successful hardware store of the new century, and as important in its effect upon the purchasing public as good light, prompt service and courteous clerks, must be accounted window display of goods. Compulsion never kept a customer, but attraction is the magnet of trade. One advertises to attract attention and arouse such interest as to make the purchaser desire to satisfy his wants of you. Attention arrested causes interest; then a want is felt, and if sufficiently attracted an order usually results.

To the passerby, the propective customer, the front of the store is the prominent part. Only when once within does he really see the stock. To him the store is determined by what he sees of it, and that is usually limited to its windows. What he there sees unconsciously gives character to his conception of the store. If he sees goods dusty and tarnished strewn carelessly about, with glass bedimmed by dust, he conceives of the store within as the same in kind, the store falls in his estimation, and he is repelled. But let him look upon a window of goods of virgin newness, unstained by dust and dirt, expressing a clearly defined idea, revealed through crystal glass of mirror polish, and at once his attention is arrested, an impression is formed, and though he should not stop he passes on with a high idea of the character, wide-awakeness and push of the place and goods he has just seen. When he does want anything in the future of that nature he will unconsciously go to the place where he was favorably impressed and attracted. Then when purchasing, if his ideal thus formed is realized, he will come again and a permanent customer will be secured.

Hence the importance of the window and the displays therein made cannot be overestimated. It not alone affects directly the man who stops and gazes within, but its influence radiates throughout the entire community, largely affecting the reputation of the store, because through it character is expressed. Window dressing is to the store what that of the person is to the individual. And as carefully should it be looked after.

#### THE WINDOW IS NEGLECTED.

As a rule, both windows and the displays of goods therein are either neglected or considered of much less importance than keeping up displays in showcase and on shelves within the store. Window displays rightly arranged and looked after have the greater effect on the prospective purchaser. Not for an instant would a man let go a hole in his money drawer through which pennies were being lost. Then why will he neglect his show windows when attention thereto would bring him dollars that neglect will lose? It comes only from a lack of knowledge of the possibilities and appreciation of the opportunities that come from an effective window display.

#### HARMONY IN DISPLAY.

Goods should never be piled in promiscuously. Individuality should be aimed at, and this can never be obtained when a large variety of objects are jumbled together. Neither should dissimilar lines of goods be mixed, nor displayed at the same time. Thus a Stove, rough Iron Ware and Silver Ware put in a window, or even viewed together, will give rise to an unpleasant impression. But take away the Silver and in its place display even a bright nickeled Tea Kettle or a Coffee Pot, and harmony is again restored through their natural association in use.

#### DEFINITENESS.

A window display should not alone attract attention and produce through its harmony a pleasing effect upon the beholder, but it must express a definite idea, in order to have the impression lasting. Definiteness of idea must be sought. This requires time for planning and execut ing. One cannot make a good display that is at all ef fective by waiting until the goods already there are being taken out before deciding what shall take their place. It means thought and work. Plan at least a week ahead, if possible. Have the display harmonize with the

wants or present interests of the people; keep it in line with some happening, either of local or of general interest. Let it express a single definite thought, with perhaps a card with a word or line of pungent explanation. If a group of objects be used let one predominate; have the others subordinate to it. This will strengthen without detracting as they would if made prominent. The fewer the kinds of goods, so as to emphasize the central idea, the better; though often contrast, with good taste and judgment, may bring out an idea and effect even more clearly.

SOME SUGGESTIONS.

Space, as well as time to plan and prepare, is important in securing effectiveness in display. Have window space as large as possible. Width, if anything, is preferable to depth of window, for then the display is nearer the passerby. Never crowd objects together. It goes without saying, in passing, that when displays are changed plenty of soap and water should be used. Scrupulous cleanliness with highly polished windows give magnetic attraction.

Make much of displays of seasonable goods, making them a little in advance of the expected time. Then when the early rush of the season comes on, and this usually is the cream of the trade, the seed-sowing has been done, and you are ready to reap of the harvest. Lay special emphasis upon Christmas and the Fourth of July. New goods and specialties, which usually give a good profit, should also be displayed in some concrete and if possible unique form.

ANIMATE DISPLAYS.

Displays may be roughly characterized as inanimate and animate or moving. Of the former, objects in themselves mean little unless combined with some design or form that will impress an idea. Designs are very effective and can be used, as is readily seen, in a countless variety of ways. Try to make the application of the idea as far as possible in harmony with the use to which it is put, for buying is but the procuring of an article to satisfy some want, and the nearer an article and its use can be shown in display the greater will be the tendency to purchase. People often forget their wants until they are brought home to them in this way. It is human nature to wish to see a thing in actual use, if possible, before buying. Nothing has greater weight or is more effective in display than actual service, especially if accompanied by motion. Form of life has effect. Thus the figure of an animal or man always attracts, but let there be motion, true to life, and when one will stop for a hasty glance at the former a crowd will linger and gaze and discuss for a length of time before the animate object. Or let life be actually there and still greater will be the attraction of the window and display.

The aids to obtain these effects and results are many. In inanimate displays, fixtures that will bring objects to the front are advantageous, such as racks, stands, shelves, especially if motion can be applied to them in some form, as in revolving racks and showcases. A little ingenuity, if one has any mechanical ability, will often produce excellent effects at little cost of combining form with motion.

ELECTRICITY.

One great aid now available for window display purposes is electricity. A small motor can be utilized to turn cases, raise or lower or even joggle objects, while electric lights in combinations of form, design and colors may make a window a scene of enchantment. In using electric lights, if softness is desired, let the light come from above, with the lamps hidden. If the idea is for striking design bring them out boldly in sight. The former brings out the window as a whole better than the latter, which emphasizes the indirect in securing attention to the display through the attraction of the light itself. Beautiful color effects may be had by colored globes.

LIGHTS AND BACKGROUNDS.

Windows are well lighted by lamps at bottom or side, but the best is from the top, light being concentrated upon the objects below. Backgrounds usually should be soft and subdued in order to bring the objects out in stronger relief. But sometimes where a display is intended to attract from its novelty a background of color or even a fanciful design may be used. A touch of color often adds effectiveness to a window display, and when in harmony with its surroundings always is attractive.

PRICES IN WINDOWS.

In general, prices should always be marked upon goods, except in cases of design or special display when a general plan is to be wrought out to the exclusion of the selling idea. A printed price is a powerful argument in its unexplained attraction as a trade drawer. As a rule give the price. The best immediate returns in a window display are often given through low priced articles of general utility, something that one can step in and buy without much thought. General effects in such lines as Stoves, Sporting Goods, &c., often give excellent lasting results.

COMPARE TWO WINDOWS.

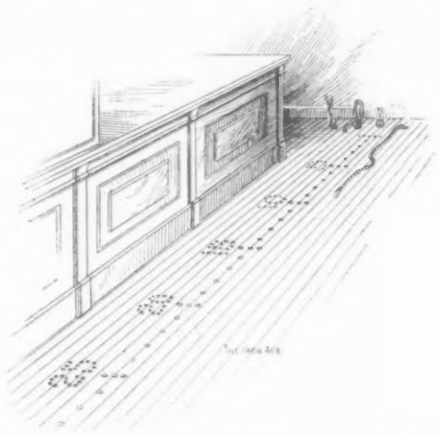
Take two windows, put in the same goods, one without much attempt at design, the other crystallized into a definite idea expressed in an attractive way, and note results. People will pass one with scarcely a glance, while lingering before the other and afterward talking it over at home, meantime often bringing many in to ask for further information or to purchase.

THE HARDWARE MERCHANT'S OPPORTUNITY.

With all the wealth of goods that a Hardware store has, there is no lack of material for most effective window displays. Take time, plan with care, give attention, make frequent changes, think, devise, execute, and one will be surprised what great results at practically no expense can be obtained in securing and keeping trade through effective window display.

## A ROPE MEASURE.

IN a Hardware store Rope is generally found to be an inconvenient article to measure to the desired length. The difficulty of doing this has been minimized in the



*A Rope Measure.*

store of P. J. Bolan, Waterbury, Conn. In this store the coils of Rope are kept in the cellar and the Rope is brought up to the store through holes in the floor, as is customary in many establishments. From near where the ends of the Rope enter the store and out in the aisle toward the front of the store, between the showcases, are placed brass headed tacks, as shown in the accompanying illustration. These are spaced 1 foot apart. At each 5-foot point three tacks are placed, and the distance from the holes is marked with smaller brass headed tacks, as shown.

THE CORBIN SCREW COMPANY, under the management of Fred. Fee, have secured quarters at 109 Lake street, Chicago, while the Corbin Cabinet Lock Company, David O. Macquarrie, manager, have rented the building at 107 Lake street. The Chicago branch of P. & F. Corbin, distributing a general line of Builders' Hardware, will retain its present location at 104 Lake street, under the management of W. C. Stephens.

## READING HARDWARE COMPANY'S CHICAGO STORE.

THE recent remodeling of the Chicago store of the Reading Hardware Company, Reading, Pa., affords an excellent illustration of how effectively a narrow store

*Fig. 1.—Display Room Looking Toward the Front.*

can be treated to bring out admirable effects in ornamentation, and how, by an ingenious arrangement of side cabinets, a full line of Hardware manufacture may be displayed to advantage. Six years ago the Reading Hardware Company moved their Chicago offices and store from 73 Wabash avenue to the present location, at 105 Lake street. The Chicago office had been established at the Wabash avenue quarters in July, 1888, by the present resident manager, W. H. Bennett. The remodeling of the Lake street store a few months since was accomplished under the direction of Mr. Bennett, conforming to the designs of John Harbster, secretary of the company. The store, which is 68 feet long and 14 feet wide, has been divided by a glass partition into a display room and a counting room. Each side of the display section—which is 36 x 14 feet, as shown in the accompanying illustration, and fronts upon the street—is lined with cabinets of highly polished golden oak. The paneled metal ceiling and the parquet floor are of geometrical design, the ornamental effect being enhanced by the use of rich rugs of oriental design. Looking from the counting room partition toward the front, the drawer cabinets on the left hand are 11 feet in length with clear top for the display of mounted samples. The forward cabinet is 25 feet long, the lower portion consisting of eight series of five drawers each, broken in the center by a bow, the entire base being mounted by six closet cabinets, three on each side of the bow, the frieze and cornice being richly carved. Each cabinet is composed of two pairs of doors, the panels of which are removable. The inside of the outer doors and both the inside and back of the inner doors are used for display, as well as the paneled back of the cabinet proper. The ornamental effect is enhanced by the use of 34 different kinds of cabinet wood. These six closet cabinets are used to display the general line of the company's factories. The front of the central bow cabinet is of heavy plate glass of semicircular design. The shelves are used for the display of Ornamental House Trimmings mounted on easel boards. The drawers of the lower cabinet are about 2 feet square, filled with mounted samples of House Trimmings, Escutcheons and Knobs and Door Trimmings. The boards or blocks for mounting vary in size, from 4½ x 12 inches to 12 x 13 inches, according to the samples to be shown. Various polished cabinet woods are made use of for this purpose.

On the opposite side of the room is a drawer cabinet 18 feet in length, divided into six sections of five drawers each, filled with sample lines of Frame Pulleys, Butts and Loose Locks, which slip into mortised boards. In a single drawer are displayed 36 sets of Locks, or 30 sets of Pulleys. On the top of this drawer cabinet are displayed a fine line of sample Trimmings on blocks and easel boards, including Store Door Handles, Cylinder Locks for front doors; Mortised Locks for interiors, and Office Door Locks. At the end of the 18-foot cabinet is a glass door

*Fig. 2.—Display Room Looking from the Front.*

epening into an aisle, giving entrance into the counting room, and, at the back, into the warehouse. In this aisle is a side wall case 31 feet long, the lower drawer cabinets being mounted by closet cabinets, the doors of which are glass. The depth of this cabinet is broken by two interior paneled doors, the panels of these doors, as well as those at the back of the case, being removable to facilitate change of samples at any time. The inner doors of this latter cabinet are pivoted rather than hinged, as is the case in the front display room.

The counting room, which is 32 x 14 feet, is utilized by the manager and clerical force. The front portion of the counting room is shown in the accompanying illustration. The back portion of the office is equipped with desks, long table and telephone exchange. The store and counting room are electrically lighted by central chan-

deliers and the cabinets by side bracket incandescent lamps.

## PRICE-LISTS, CIRCULARS, &c.

ARTHUR R. ROBERTSON, Boston, Mass.: Illustrated price-list of Horseshoe Magnet Hammers and Bill Posters' or Advertisers', Tack, Undertakers' or Casket Trimmers', Upholsterers' and Paper Hangers' Hammers.

SILVER & Co., Brooklyn, N. Y.: Preliminary pages illustrating a few of their household inventions, including Coffee Pots, Roasting and Baking Pans, Blue Flame Wickless Oil Cook Stoves, Vegetable and Beef Presses, Steam Cookers, &c. A complete catalogue will soon be issued illustrating an entirely new line of House Furnishing Goods.

F. E. KOHLER & Co., Canton, Ohio: Illustrated circular devoted to Steel Coal and Furnace Scoops, Steel Furnace and Snow Shovels, General Purpose Shovels, Sidewalk Scrapers, &c.

NEWHALL CHAIN, FORGE & IRON COMPANY, 9-15 Murray street, New York: Catalogue No. 55, relating to Conveyor, Dredge, Loading and Stud Link Chain, Clevises, Shackles, Swivels, Boat Spikes, Hooks, Connecting Links, Rafting Dogs, Mooring Posts, Capstans, &c. &

KITSELMAN BROTHERS, Muncie, Ind.: Circulars relating to the Kitselman Ornamental Fence. Eight different

*Fig. 3.—The Counting Room.*

designs of Fence Fabric are manufactured by the firm, which can be used with wooden posts and top rail alone, with malleable cresting, or on steel posts and rails with cresting and ornaments, braided wire above or plain rail.

JAMES L. TAYLOR, Newark, N. J.: Catalogue No. 4, with revised price-list, August 1, of the Taylor Quick Adjusting Self Locking Screw Clamps. According to size, the Clamps are tested to a safe clamping strain of from 1200 to 5500 pounds. Carpenters' and Cabinet Makers' Quick Adjusting Self Locking Clamps are also included in the line.

THE INTERNATIONAL FENCE & FIREPROOFING COMPANY, Columbus, Ohio: Catalogue No. 14, devoted to illustrations and prices of Plain, Coiled, Barbed and Ornamental Fences and Gates. Also catalogue C, relating to the International System Cabling and Metallic Sheeting for concrete reinforcing, especially adapted to flat and hollow arches, columns, conduits, sidewalks, cement stores, hollow tile, ceilings, beams, elevator shafts, retaining walls, &c.

THE SNOW MFG. COMPANY, Batavia, Ill.: Catalogue illustrating Wind Mills, Towers, Pumps, &c.; also circulars relating to Four-Passenger Galvanized Lawn Swings.

WM. AINSWORTH & SONS, Denver, Col.: Ainsworth Standard Balances. The illustrated catalogue devoted to Assay, Pulp and Chemical Balances states that the Balances are designed for the use of assayers and chemists who are interested in securing the best results with a minimum expenditure of time, and that the firm are the only manufacturers of fine Balances who make every part entering into their construction, buying nothing but raw material.

THE MARLIN FIRE ARMS COMPANY, New Haven, Conn.: Illustrated price-list of Marlin Repeating Rifles, Carbines, Muskets and Shotguns, also Rust Repeller, Reloading Tools, Sights, &c. The catalogue is arranged in three sections, Part I being designed for the quick reference of dealers and consumers, Part II for the consumer who wishes more complete information, while Part III gives some hints for shooters in general.

THE EAGLE LOCK COMPANY, Terryville, Conn.: A number of insert pages for their catalogue, Volume 18, relating to Chest, Wardrobe, Pad and Trunk Locks, Escutcheons, Strikers, &c.

THE BURDICK & DE BLOIS MFG. COMPANY, Hartford, Conn.: The Burdick Cash Register Bank. The company issue a pamphlet in the form of a bank pass book, setting forth the advantages derived from using their Bank.

## A LAMP WICK CASE.

IN the store of James Wilson, Stamford, Conn., Lamp Wicks are kept in a convenient, orderly manner in a home made tin box, which is divided into compartments and has glass doors. This is illustrated in Fig. 1.

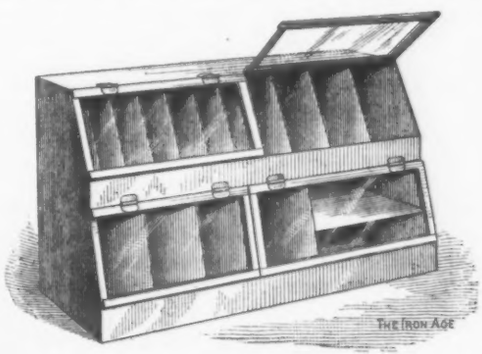



*Fig. 1.—A Lamp Wick Case.*

The case is 26 inches long, 13⅞ inches high and 5¼ inches wide at the bottom. Through the middle of the case, as shown in the front elevation, Fig. 2, is a horizontal shelf dividing the case into two sections, in the upper one of which are ten vertical partitions separating the spaces into pigeon holes that vary

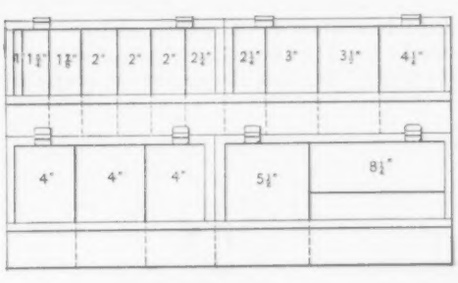



*Fig. 2.—Front Elevation of Case.*

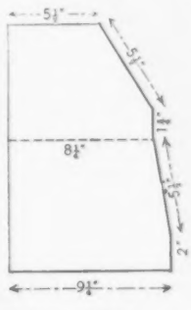



*Fig. 3.—Section of Case.*

in width from 1 to 4¼ inches. In the bottom section there are four vertical partitions and one horizontal. Fig. 3 shows a section of the case. On the front of the case are four doors, the frames of which are made of tin strips that are turned over and soldered together, as shown in Fig. 4. Two hinges are soldered onto each of these doors and also to the tin of the box,

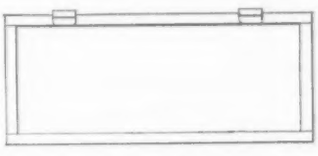


*Fig. 4.—Construction of the Left-Hand Doors.*

as is shown in Fig. 1. From Fig. 4, which shows a construction of the left hand doors, it will be seen that the panes of glass are slipped in from the left side. The right hand doors are made the reverse of these and the glass is slipped in from the right hand side. This case is very neatly made and has proved itself to be a valuable fixture in the store.

## AMONG THE HARDWARE TRADE.

Oscar Donaldson is successor to Wm. E. Richards in the Hardware, Agricultural Implement, Vehicle and Harness business in Georgetown, Ky.

R. H. Muzzy has disposed of his Hardware and furniture business in Centralia, I. T., to Allen & Gray.

Wise & Fisherbuck have opened up in the Hardware business at 4265 Milwaukee avenue, Chicago, Ill. The firm consists of Elmer Wise and John L. Fisherbuck, formerly of Upland, Ind., who exchanged an Illinois farm for the business.

H. W. Thomas has purchased the Hardware and Agricultural Implement business of Holden & Holland, in Winfield, Iowa. Mr. Thomas has made some improvements in the store and is doing business on a strictly cash basis.

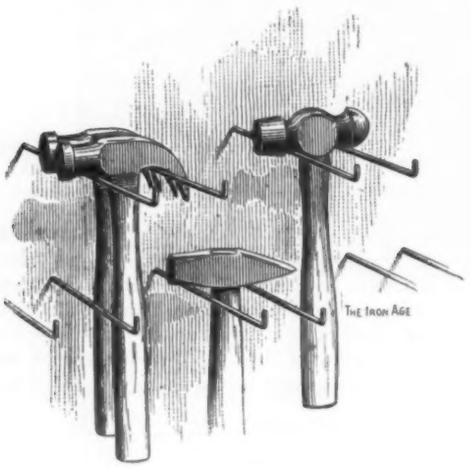
Chas. P. Moore of Ravenswood has just purchased the Hardware stock of H. F. Goff at Spencer, W. Va., which business will be continued under the style of Chas. P. Moore & Co., the members of the firm being Thos. J. Moore, Tom G. Moore and Chas. P. Moore. The business at Ravenswood will be continued as heretofore by Chas. P. Moore.

The stock and fixtures of H. M. Sponenberg, Watertown, N. Y., have been purchased by P. Connell and M. Rice, who will continue the business in Shelf and Heavy Hardware, Dairy Supplies, &c., under the style of Connell & Rice.

Geo. A. Meyers & Co., 63 Washington street, Paterson, N. J., have incorporated with a capital of $50,000, Geo. A. Meyers being president and treasurer, and F. L. Stellwagen, vice-president and secretary. The company will conduct the wholesale and retail business in Shelf and Heavy Hardware, Mill Supplies, Agricultural Implements, &c.

## DISPLAYING HAMMERS.

IN the store of P. J. Bolan, Waterbury, Conn., Hammers are kept in a glass front cabinet and are suspended as shown in the accompanying illustration, upon round iron rods slightly bent at the end to prevent the




*Displaying Hammers.*

Hammers from slipping off. These rods are securely driven into the back of the cabinet. Each pair will hold six of the average size Hammers.

A. R. FISSON, traveling salesman for Russell & Erwin Mfg. Company, New Britain, Conn., and New York, met with a serious accident some days since at Chattanooga, Tenn. Mr. Fisson's left arm was broken in several places, and it will be some time before he will be in a position to resume his visits to the trade.

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# THE TRAVELING SALESMAN HIS METHODS AND CONTROL

BY SAMUEL MASTERS.

## CHAPTER XXVIII.—THE MANUFACTURER WHO REPRESENTS HIMSELF.

IN the matter of representation the manufacturer has an advantage over the jobber, for he is not compelled to work by rule and hedge himself and his interests about by restrictions which while of value in preventing the least trustworthy of his men from making losses are a hindrance to men whose judgment and experience warrant a free rein.

The manufacturer who has the least trouble with his road representative is the one who does his own selling. There are a good many of the lines of manufacture embodied in the Hardware trade where it is possible for such a condition to exist—goods which have a limited season of sale, when a short, hot campaign for orders once a year is all that is required. In a great many such lines the manufacturer relies mainly upon his own efforts to personally visit his regular trade in the selling season, and to keep in touch with his customers during the rest of the year he depends upon correspondence, supplemented by an occasional hurried trip, or places his line in the hands of a syndicate salesman who reports conditions as he finds them.

### Value of Personal Visits.

However well he may be represented otherwise, the manufacturer who would keep abreast of the times must make an occasional trip to see his customers. He cannot hope by any other means to keep that grasp of affairs, and to obtain that intimate knowledge of trade requirements and tendencies that the present demands. It is the man who stays at home who comes to look upon the Hardware buyer as a confirmed liar, and frets over the little unpleasantnesses connected with extra discounts, deliveries and deductions; it is he who never introduces a new article or makes an improvement until his rival has shown him the way, and it is he who continues to make and pile up in his stock bins goods for which the demand is waning. There was one Hardware manufacturer who confessed to a retailer who called upon him that for 20 years he had not come into personal touch with a retail merchant handling his line, but had depended upon his salesmen for information concerning their needs. He later failed in business, simply because of the rapid improvements in his line which left him out of the market.

### Viewed Through a Salesman's Eyes.

A salaried salesman cannot be depended upon in such matters. He may be conscientious in the reports he makes, but there are things—and often the most important of all—which escape his notice or the value of which is underestimated. In most instances he is out to sell goods, and constant recommendations to change the line or fault finding with unfavorable trade conditions are regarded by his employer as disloyalty, when in nine times out of ten if he were in the salesman's place, and could see personally the things which he discredits in a report his action would be very different and an improved condition of affairs would result. If the salesman reports new goods and discoveries regarding rivals' wares it is old history by the time the manufacturer gets the information. Oftener than not the salesman makes no report, except of competing prices, for he does not care to be the medium that conveys unwelcome news to his employer.

### Influence of Acquaintance.

In addition to this there is the question of personal relations to add weight to the argument in favor of the manufacturer's visiting his customers. A personal friendship between a salesman and a buyer is sometimes a good thing for the manufacturer—and sometimes it is decidedly the reverse, for it is the manufacturer's salesman who has often an additional 5 or 10 per cent. in reserve for an emergency who goes to the bottom in a desire to please his friend the buyer, far oftener than it is the buyer who will pay a cent above the lowest price because he desires to serve a salesman. The salesman who exceeds his instructions and makes trouble for his employer is the man who has a friend in the buyer's chair. But the effect of the manufacturer's friendliness with his customer has a very different effect upon his business. His word is final, and when he says a thing cannot be done the buyer desists from useless attempts in that direction. On the other hand, if he has a just claim to present or a good argument to advance, he can speak with confidence that his cause will be given a hearing, and not be dismissed because of an imperfect report by a salesman whose word may not be taken at par by the manufacturer who employs him.

### Successful Manufacturers Travel.

If a list could be written of the 25 or 50 Hardware manufacturing concerns that have shown greatest progress in the last ten years it would certainly contain more names of houses whose active members called upon the trade than of those of whom the contrary is the case.

### The Employer's Route.

When a manufacturer can do so it is a good plan for him to keep a few good customers for his own personal clients and visit them at regular intervals. Even if he has a dozen men out and if his time is so occupied with the production of the goods that he can give the question of sales but scant attention personally, he will find that the information he gets in this way and the attention he must give to the matter of sales and selling policy in order to properly care for his personal trade will help him in all portions of his business as nothing else can.

### An Aid to Salesmen.

He will also find his relations with his salesmen enough pleasanter to make it pay. The man who stays at home and who gets out of touch with the troubles and anxieties of his salesmen cannot always judge aright of the complaints he hears, and comes to underestimate the difficulties under which his salesmen labor, a course which is more dangerous than to give full and unquestioning credence to a salesman's statements and to rely implicitly upon their judgment and their knowledge of conditions.

### Where Knowledge Counts.

The salesman considers the salability of the goods alone. The manufacturer can tell the relation between cost and selling price—the additional expense of alterations that will make the goods sell for more, or sell more readily, the possibility of finishing or packing the goods differently to suit a customer's requirements and the practicability of adding to the line new goods which his customers desire.

## A POLITICAL WINDOW.

W. H. GOEBEL, an enterprising Hardware merchant of Santa Fé, N. M., recently had a window display which attracted much attention. Mr. Goebel called it a "Democratic window," and the way he regards the chances of the prospective candidates for the Presidential nomination by that party was very clearly made known. The window was filled with Stoves of various sizes. The largest of the collection he labeled Cleveland. Others, consecutively smaller, were designated Gorman, Bryan, Hearst and Parker, in the order named. The chances of the last two named are not regarded with much confidence, as they are represented by two Camp Stoves. The display occasioned no little comment.

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By mutual agreement of their stockholders, Wm. Wilcox Mfg. Company, manufacturers of Padlocks, Hames, Saddlery Hardware, &c., Middletown, Conn., are in process of dissolution. The water privileges, real estate, machinery, tools and fixtures are accordingly for sale. This action has been taken principally because those who have been actively identified with the management of the company are desirous of giving their attention to other interests.

# BRITISH LETTER.

Offices of *The Iron Age*, Hastings House, Norfolk St., London, W. C., August 15, 1903.

## The Week's Hardware Trade.

THE prevailing feature of the retail trade at the present moment is shortness of ready cash. I have once or twice recently alluded to this, and subsequent information is but so much indorsement of the fact that money is very tight. Recently a Sheffield traveler started out to gather £1000 in the London market, and came back with less than £20. Another traveler, whose customers owed some £1500, only managed to secure £30. This shortness of cash is compelling small houses who have not much reserve capital to dispose of their stocks at heavy loss to obtain cash to meet pressing liabilities. This, in its turn, has reacted on many of the larger firms, who have not only to renew bills but to allow heavy discounts to do business. The monetary situation over here, as it affects the retail trade, is distinctly unsatisfactory.

Trade otherwise is dull, both on home and overseas account. There has been some slight stimulation in certain localities of the building trade, but it does not amount to much. Increased purchases were made in Belfast, Dublin and other Irish towns in consequence of the recent royal visit there, but this was hardly felt. On overseas account, with the exception of Canada and India, trade shows a distinct setback. Especially is this true of South Africa. It is now recognized that out there the country must digest the heavy stocks which have already been sent out before fresh business can be done. This experience is not confined to British travelers alone, as German travelers are meeting with precisely the same experience. An interesting outcome of this overstocking in South Africa is that a number of commercial travelers have received instructions to turn their attention to South Asia and the Far East. As the political outlook in the East Indies and in China is now reasonably serene, attempts are being seriously made to increase trade in those regions. There is a perceptible tendency on the part of British manufacturers to abandon the policy of appointing resident monopolist firms in the chief Eastern centers of distribution, and to substitute for these the appointment of permanent travelers, who take up their residences at suitable ports and act as the general guardians of the interests of their employers. By these means it is hoped that the home firms will be more adequately informed as to competitive conditions.

Another district which is engaging the attention of French merchants is the Levant and the near East. A party of French merchants, to the number of about 130, propose to take a tour in the Eastern Mediterranean during the coming autumn, with the particular object of studying the trade and commerce with a view to developing French trade in the markets of Turkey and Greece. Constantinople, Broussa, Mytilene, Smyrna, Salonica and Athens will be visited under the auspices of the French Chamber of Commerce, and special arrangements are to be made to bring the members of the party into touch with the leading business men in each of the places mentioned. Only those interested in the industrial and commercial products of France will be allowed to participate. As I have in these columns frequently expressed the opinion that the Eastern Mediterranean was capable of commercial development, I am not surprised to find that the subject is being taken up in this practical way by a responsible business organization. If it pays French exporters and manufacturers to undertake such a trip as this, it seems to me to be equally well worth the attention of Americans.

## British Retailers and Direct Supply.

I propose, from time to time in these columns, to deal with some of the practical difficulties which British retail Hardwaremen have to contend with in the hope that such topics may prove of some value and interest to American merchants. The conditions obtaining in this country are not, of course, those in America; but it is obvious there are many points of common interest. A source of perpetual irritation to the British retail trade is the direct supply of goods to consumers, which otherwise would pass through their source. The majority of Hardware manufacturers transact their business through the retail trade, and there is no complaint to make on that head. But various trade organizations from time to time arise and become so powerful in their way that a large number of manufacturers cannot afford to do without their trade. Thus, another channel is dug, connecting the consumer with the manufacturer, without touching the recognized retailer. The co-operative movement is a case in point, and upon that I hope shortly to give a number of interesting facts and figures. In Great Britain we have not the catalogue house to one tithe the extent to which it prevails in America. The army and navy and civil service stores and organizations of that sort are, strictly speaking, co-operative stores, but they are not in the usual way associated in our minds with the co-operative movement. They do a considerable business in all parts of the island with the wealthy classes. This week one particular firm of direct trading has received the condemnation of a British jury, and is likely in some degree to suffer in consequence. For many years past it has been impossible to take up a cheap weekly or monthly journal without seeing the advertisement of J. G. Graves of Sheffield. In these advertisements this enterprising gentleman has offered to supply practically every article of domestic or personal requirements direct through the post—jewelry, Cutlery, Hardware, bed clothes, watches, small furniture and a multitude of other things have all brought grist to his mill. Retail Hardwaremen, dry goods stores, jewelers and others have gnashed their teeth whenever they saw these advertisements, but were impotent to interfere. It happened, however, recently, that Mr. Graves was a candidate for the City Council of Sheffield, and his opponent a prominent solicitor, who had knowledge of the victims of J. G. Graves. The election waxed fast and furious, and in the course of it the solicitor wrote and published a letter to J. G. Graves, in which some interesting and offensive assertions were made. Unwisely for himself, as it afterwards transpired, Mr. Graves brought an action for libel, which was tried last week. The facts elicited at the trial bring out very clearly the possibilities of advertising. It appears that J. G. Graves has for some years past been spending from $150,000 to $200,000 a year in advertising, and employs about 3000 persons directly in the business, in addition to which he has about 70,000 agents, who sell watches and other articles in his behalf. Last year he had about 655,000 customers upon his books, and his turnover reached nearly $5,000,000. The business must surely be most remunerative, for in his evidence J. G. Graves stated that he only started the business 17 years ago with a little capital, and that he is now only 37 years of age. He sells 30,000 watches every year. His method of business is to invite in different localities various persons to become agents. He allows his agents 7½ per cent. commission on goods other than watches, and 10 per cent. on watches. The agent has no stock, but it is his business to bring before the notice of persons in the neighborhood the system of business. Assuming that someone wants an article coming within the compass of the Graves catalogue, he sends for it and remits an installment of its price. Then the article is sent on approval. The customer does not become the purchaser until the end of seven days. If at that time he approves, he either pays on a system of installments, or, if cash down, is entitled to some other article to the amount of 10 per cent. of the price of the original article.

Obviously, the weakness of the position is that there is no personal contact between seller and buyer. The whole thing is a vast machine, heartless and relentless. This becomes evident from the evidence of J. G. Graves, who stated that in 1902 he opened 585,209 accounts and brought 13,271 actions in the county court. He employs a solicitor at $17.50 a week to recover these amounts. From time to time certain of his customers finally go to prison. During the hearing of the case the defendant called out the names of several persons present in court, who stood up and said that they had been sent to prison as a result of proceedings taken by J. G. Graves.

In cross-examination, J. G. Graves was asked as to the profits he made on the goods he sold. It was alleged by defendant that watches for which 19 shillings were paid sold for 50 shillings; mantles that cost 4 shillings 9

pence, were sold for £1 1s., and clothes, costing 23 shillings 6 pence, were sold for 50 shillings. The plaintiff explained that the cost prices could not be fixed, that they varied, and that often, as in the case of watches, his profit was not more than 2 or 3 shillings. At this point the judge remarked: "There must be something very bad about a system where a watch costs 19 or 20 shillings and is sold at 50 shillings and yet only brings a profit of 2 or 3 shillings." Before the plaintiff had got half way through his cross-examination the jury intimated that they had heard enough, and the case was dismissed. The result has given immense satisfaction to the retail trade throughout the country.

As it appears to me the moral of the whole story is that in the distribution of goods there has got to be personal human contact, as between buyer and seller. To know when to give credit, to know when to avoid it, to handle customers sympathetically, seems to me to be as much the function of the distributor as to be the mechanical channel through which goods are delivered for consumption. However, there are other cases in this country not dissimilar from that of J. G. Graves, and I give some account of the case as an example of some of the difficulties with which the retail trade in this country has to contend.

### The Galvanized Iron Trade.

The members of the Midland Galvanized Iron Trade Association had this week before them the statistics of the summer trade. Much satisfaction was expressed at the circumstance that from January up to the end of July the value of the shipping trade amounted to more than two and a half millions sterling, which is an increase of over 12 per cent., upon the same period of last year. The total quantity sent abroad was 208,000 tons. Orders from the Argentine Republic have been exceptionally good lately and continue heavy.

### A Note on Solingen.

The German town of Solingen is, of course, known to American importers and exporters as being the center of the German Cutlery trade. Owing to its situation, high up among the hills, Solingen has long suffered from an insufficient water supply, alike for drinking purposes and for motive force in the production of electricity, and it has been no unusual thing in the hight of a hot summer for water to be a marketable commodity at a penny or 2 pence a bucketful. The valley above the town has now been dammed with a reservoir embankment that ensures Solingen a permanent and an abundant supply of water, both for domestic and trade uses. The embankment is of solid masonry, and it holds up about 500,000,000 gallons of water, a little more than half the contents of the new Sheffield reservoir at Langsett. The total cost of the dam and the new water works, of which it forms the most important part, has been $625,000. The new reservoir will enable Solingen to dispense with the machinery that has hitherto pumped up the water required for the town's supply, and it will also guarantee —what is of even more importance to the industry of the place—a cheap supply of electrical energy produced by water power.

### The Wire Nail Trade.

A good deal of discussion has arisen out of the letter written by Arthur Chamberlain on the subject of free trade in Wire Nails, a letter upon which I commented last week. One importer writes that the whole quantity of British Wire Nails is only a tiny fraction of the trade done in this country. He says that there are a number of firms like himself, who placed orders for 1000 tons at a time in Germany and America. He adds that it may or may not be to the advantage of Great Britain to buy so cheaply, but that there is no use in disguising the facts. A. J. Reynolds of John Reynolds & Sons, Limited, writes:

Whatever may be the cause of the foreigner's success in some trades, it is not in this case due to any natural advantages, and the "wiser methods of business" referred to by Mr. Chamberlain as being adopted by them are comprised in securing, first, a satisfactory home market for themselves, and then taking the major portion of our home market under a system of export which is practically bounty fed. As pointed out by the correspondent to whom Arthur Chamberlain replies, there is no "secret of cheap Wire Nails" that will enable any British manufacturer to compete with the foreign Nails sent here at considerably under cost price. The Wire Nail trade is, however, an incident in the larger question affecting many other trades also, which is this, shall we as a nation indefinitely make a present, so to speak, of our home market to our foreign competitors, while they carefully keep their own market to themselves in spite of all prognostications to the contrary when this country adopted what now goes on under the name of "free trade."

An angry correspondent to *The Ironmonger* sums up his arguments thus:

1. A duty should be put in this country on German Wire Nails equal to the export bounty (say £3 per ton) paid to the German manufacturers by their syndicate. Then British competition would be "natural."

2. Some years ago the Americans sold Barbed Wire delivered at foreign ports at £8 10s. per ton, while they charged their home consumers £13 per ton. Hence they worked up so flourishing an export trade that in some markets it is impossible to sell the British article, although it is better and lasts twice as long.

3. Mr. Chamberlain is wrong in saying that before long his able men will discover the secret of cheap Wire Nails. There is no secret. The sole reason why they are cheap outside of Germany is the export bounty.

4. There are in Great Britain 3,000,000 unoccupied males who have enough to live on, and 1,000,000 paupers. We should aim at increasing our productive or industrial class.

5. Nearly £600,000 worth of "Nails, screws and Rivets" (mostly Nails) are imported yearly into this country. The quantity of 7 to 18 gauge Wire Nails made in Britain is a mere fraction of that which is imported.

6. The prices per hundred weight for August of Ordinary Round Continental and British Wire Nails, respectively, are as follows:

| Gauge. | 8 | 10 | 12 | 14 | 16 | 18 | |
|---|---|---|---|---|---|---|---|
| | s. d. | s. d. | s. d. | s. d. | s. d. | s. d. | |
| Continental.. | 7 5 | 8 2 | 9 5 | 10 11 | 13 2 | 17 2 | (less 2½ % f.o.b. Antwerp) |
| British .....| 10 6 | 11 5 | 13 6 | 15 9 | 19 0 | 24 0 | (less 5 %) |

7. British exporters buy large quantities of Continental Nails, and many British ironmongers' shops have tons of them. The profit on these Nails goes into the hands of a few buyers. The loss is suffered by the working man, because the labor represented in producing these Nails is lost to this country.

### The German Retail Hardware Association.

Mention of the British retail trade reminds me that the official report of the proceedings of the fifth annual conference of German Ironmongers' Associations, held at Carlsruhe early in June, is now completed. This association not only runs its annual conferences, but also annual expositions, the rule being to select a different town each year alternately in the south and in the north of the country. It appears that the association loses on the transaction, finding the hall for the exhibits which are limited to those firms who act in accord with the regulations of the association in the matter of direct trading, and so forth. The subscriptions are paid to the central body in Germany, and not to the local associations as in Great Britain and America. The central exchequer in its turn makes grants to local associations who can prove that they have done active work during the preceding year. The central body has in contemplation the issue of an illuminated diploma to be presented to apprentices on the completion of their indentures, and of a silver medal to be given to assistants who have served with one employer for 25 years in succession. On the relations between the associated German Hardwaremen and the Federation of Tinware Makers, an interesting discussion grew up. The German Association had entered into engagements with sundry German manufacturers' syndicates, under which the latter undertook not to sell goods to co-operative stores or cheap bazaars, in return for the business support of the Ironmongers' associations. Sixteen manufacturers of Tinware had made bargains of this kind, but the Tinware Manufacturers' Association, as such, was not a part of the contract. That association wrote that the arrangement had ceased to be of advantage to the Tinware makers, because it had led to the starting of a number of works which made it their business to manufacture expressly for stores and bazaars, and

to sell their surplus on the open market with the "loyal" manufacturers.

The annual report announced an increase in membership from 1318 to 1414, and the financial condition is calculated to make the mouths water of the British Associated Ironmongers. They have $15,000 invested in gilt edged securities, in addition to which there is a handsome balance in the bank on current account, and two annual donations of $1250 each were given to the Pension Fund. The association has its own office, with a paid secretary, and five assistants. In 1902 6702 letters, 1577 post cards and 119,925 circulars were sent out.

It appears that the association is largely occupied in resisting the encroachments of the syndicates of manufacturers, so that the question of direct trading is not only of interest in America and England, but also in Germany. Altogether, the German Association of Hardware Retailers is quite alive to the dangers which beset the retail trade.

## NEW ORLEANS NOTES.

FROM A SPECIAL CORRESPONDENT.

WITH good or excellent prospects current through the agricultural region tributary to New Orleans, and with the season for the moving of crops approaching, the Hardware trade in New Orleans is brightening up every day from the lassitude and inertia that characterized it during the early weeks of August and the last of July. Movements into the country just now are chiefly in mill supplies, feedstuff, heavy plowing and harvesting implements, and to some extent Building Hardware. Local trade in the city is chiefly in Household Hardware, Building Hardware and Tools. Exports are chiefly in Farming Implements to the West Indies, to Central America and, to a certain extent, to Mexico. The foreign business is just now a little slack. Deliveries are expected to quicken when the sugar and cotton crops begin their autumn movement.

Such is the situation in brief. More at length, the outlook for the coming season is very bright, and is based upon the more than ordinarily hopeful reports that come into New Orleans from Mississippi, Louisiana, Texas, Arkansas and Alabama. Here in New Orleans, as elsewhere through the South, the crop and business year divides naturally at September 1. At that time the corn, the cotton, the sugar, and to a great extent the rice, begin their journey from the producer, through the distributer, to the consumer. Just now the cotton reports are excellent. The prospect is for an average crop; but that to be sold at a price far above that received for any crop in many years. From the cane district the news is good for a fairly good crop, and with every evidence that a fair return for the product will be received. The rice crop, which is already being moved, is said to be the best and the largest ever grown in the Louisiana-Texas belt.

Through the yellow pine belt, along the Gulf coast, from Pensacola to the Texas line, tremendous strides have been made in exploiting the fields, and the movement during the fall and winter is expected to far surpass everything in the past. In consequence of all this there is a teeming air of activity, and a genuine demand for nearly all goods that is excellent. Reports from all trades in New Orleans indicate the increase in the volume of business during the year to end September 1 to have been between 20 and 25 per cent. All lines declare they expect an equal increase, at least, for the coming year.

These conditions have acted directly upon the Hardware business of the city. Just now the planting interests are ordering heavily for new Land Plows, for Feedstuff Machinery and Implements to handle the large amount of provender of various kinds raised and cured upon the plantations. Into Mississippi and Arkansas the orders for Plows for bringing new land into cultivation are going very heavily. To the cane growing region there are now going shipments of Cutters and Choppers in large quantities. The custom of feeding low grade molasses to stock upon rough fodder has brought this about: the fodder of all kinds being chopped fine and kept until needed and then fed with a liberal amount of the molasses poured upon it. The results have been very satisfactory, and have largely increased the demand for the necessary implements. To the rice region there have been sent considerable shipments of Harvesting Implements, Hardware and Machinery, together with some shipments of building material, Hardware and Tools to supply the needs of the immigrants entering the territory under the stimulus given by the good crop reports.

Mill Supplies and Hardware are going just now very heavily to the sugar houses and the gin houses through the cane and cotton sections of the country. These are all being repaired for the winter business. Belting, Twine, Bolts, Piping and other accessories are particularly sought after just now.

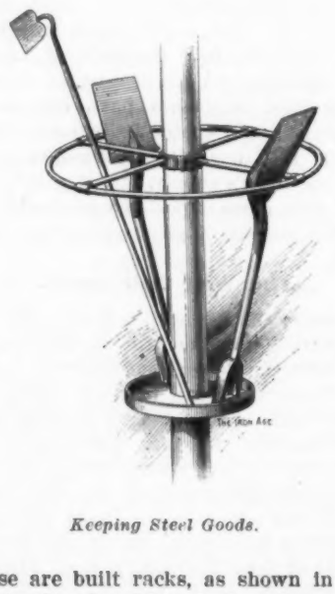
To the saw mills through the yellow pine belt and in the cypress country heavy shipments went during July, that being the month usually chosen for repairs and renovation of plants. However, there is still considerable demand for the Hardware used in this line. The growth and development of new establishments through the country has created a considerable continuous demand for outfitting material, although many of the new establishments buy all their equipment from Northern firms who make these lines a specialty. It is said in local circles that poor railroad service has seriously injured the saw mill supply business locally.

Ship chandlery, which is largely in the hands of one or two local firms, has been brisker during the dull season than is usually the case, chiefly for the reason that more vessels have found it advisable to purchase supplies of that kind on this side of their passage than on the other.

Among the city retailers there has been considerable business during the last fortnight, although the season is usually the dullest of the year. During the entire summer disturbances in the building trades have retarded and hindered building operations, and have thus interfered with the Hardware business connected with that work; but all these squabbles have now come to an end and building is going merrily on in all parts of the city. The moving season is approaching, and during the next six weeks there will be large local sales of Household Hardware, Stoves, Kitchen Utensils, &c. This trade will continue with considerable briskness until after the holidays.

## KEEPING STEEL GOODS.

IN the store of Barlow Brothers & Co., Waterbury, Conn., are quite a number of large pillars. Around



*Keeping Steel Goods.*

some of these are built racks, as shown in the accompanying illustration, in which steel goods are kept. The bottom shelf of these racks is placed about 7 feet above the floor so as to clear the heads of customers and clerks. The upper part of the rack is made of pipe, as shown in the illustration. This method of keeping these goods utilizes space which would otherwise be wasted and displays the goods to advantage.

## MISCELLANEOUS NOTES.

### Home Bottling Faucet.

McKenna Bros. Brass Company, Pittsburgh, Pa., are offering a faucet made especially for bottling beer at home. The faucet is provided with two tubes running from keg to bottle, one to allow the beer to run into the bottle and the other for the return of the foam to the keg. The manufacturers state that with the faucet beer can be bottled perfectly by any person without the possibility of spilling a drop or losing any of the natural gas or spirit of the beer, and that no air vent is required in the top of the keg, as the air and foam from the bottle returning to the keg keep an ample pressure.

### New Haven Clock Company.

The New Haven Clock Company, New Haven, Conn., are adding to their product a line of gold plated clocks of new design and finish. They are also making new lines of walnut and oak mantel clocks and chime clocks.

### The All Right Window Fastener.

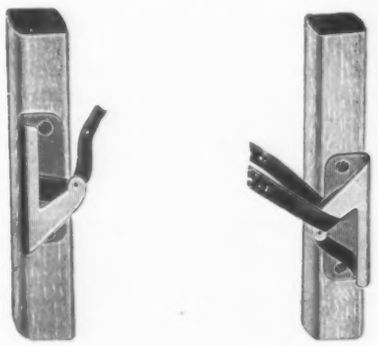
The window fastener here shown is represented on a section of window sash. The tee-shaped piece, No. 1, or face, is pressed against the window stop by the spring, No. 3, the spring exerting a pressure of 45 pounds. When the window is raised by lifting on the lever, No. 2, it

*The All Right Window Fastener.*

draws back the face from pressing against the window stop, and when the lever is released it permits the face again to press against the stop, securing the window at that point. To permit the window to be locked a mortise 1-16 inch deep, the size of the face, is made in the window stop. Among the advantages claimed for the fastener are the following: That it obviates the necessity of sash cord and weights, that the sash will remain where placed without vibration and that it provides against broken glass by falling of the sash. The fastener is offered by the O. C. Little Pulley Coating Company, Menasha, Wis.

### Breiding's Automatic Hold Back Hooks.

Henry Breiding & Co., Sterling, Ill., are offering the hold back hooks shown herewith, which, in use, are fastened under the shafts with the open hook inside and toward the front. Among the points of excellence the following are mentioned: That the hooks save hitching and unhitching, that they release a horse if the singletree gives out or the traces become unhooked, that they will prevent many accidents and save many lives, and that there are no springs in their construction which might




*Breiding's Automatic Hold Back Hook.*

get out of order. The hooks are furnished in black and nickel finishes.

### Gold Glass Letters.

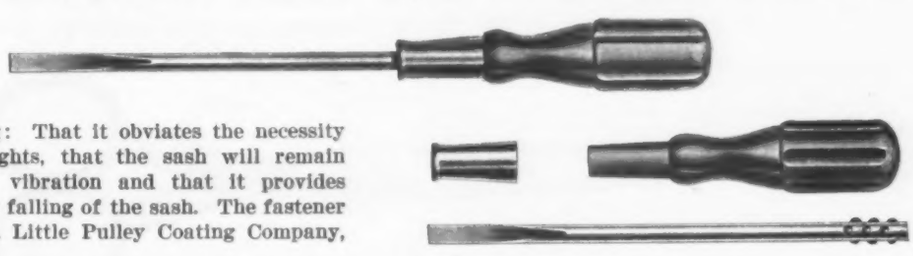
The gold glass letters, one of which is shown herewith, are made of molded glass, burnished with gold underneath and backed up with paint to make them water

*Gold Glass Letters.*

proof, so retaining their brilliant appearance. The letters are referred to as showy and attractive. Being attached to the outside of glass in the same manner as enameled letters, they are easily put up and are very conspicuous. Figures as well as the letters are manufactured by A. V. Taylor & Co., Cincinnati, Ohio, in the style shown in the illustration, in 2, 3, 4 and 6 inch sizes.

### Cassady Screw Drivers.

The accompanying cuts represent screw drivers with fluted mahogany finish handles, winged end to blades to prevent them turning in handles, drawn steel tapered ferrules, and with blades slightly hollow ground to aid in keeping them in the screw slot. The blades are referred



*Cassady Screw Drivers.*

to as being of the best quality of crucible steel, carefully tempered and oiled. It is pointed out that the Cassady method of working the stock and flattening and tapering the blade does not destroy the temper of the steel. The tools are made in ¼-inch size from 2 to 10 inches, inclusive, and in 5-16 inch size from 4 to 10 inches, inclusive, in the Thompson factory of the Federal Mfg. Company, 6106-6130 Lasalle street, Chicago, Ill.

## Black Finish Butchers' Saw Blades.

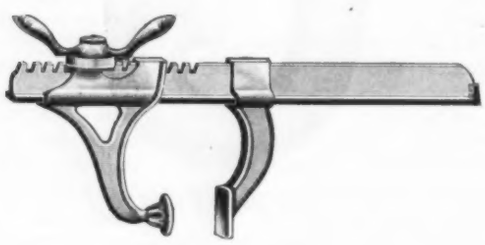
The Goodell-Pratt Company of Greenfield, Mass., are just bringing out a line of black finish butcher saw blades, shown herewith. The saws are made from a high grade of steel. The teeth are filed, set and refiled after setting, tempered but not polished. The holes are punched and blades are furnished ready for use. The manufacturers claim that they will neither buckle nor break, and

*Black Finish Butchers' Saw Blades.*

that they can be refiled if the user so desires, although at the price charged it is cheaper to throw away the blades when worn out or dull, the user effecting some saving because the polish is omitted.

## The Herbert Clamp.

The clamp shown in the accompanying cut is made of malleable iron, there are no screws, and it can be adjusted instantly to any thickness within its scope. In use the clamp is put on the article to be held, the under jaw is slid up to the article and the handles are given a turn or two. The operation is referred to as almost in-



*The Herbert Clamp.*

stantaneous. By the self adjustment of the loose lower jaw and the oscillating button on the top jaw the clamp can be used on a bevel as well as on a level surface. The point is made that the clamp will not slip after being put in position. It is put on the market by the Holliday Mfg. & Engineering Company, 200-202 South Clinton street, Chicago, Ill.

## Gold Ornamented Gun Metal Handle Scissors.

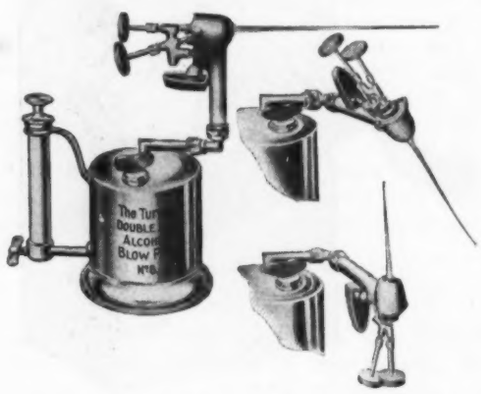
Graef & Schmidt, 107 Chambers street, New York, sole agents in the United States and Canada for J. A. Henckels, Solingen, Germany, manufacturers of the "Twins"

*Gold Ornamented Gun Metal Handle Scissors.*

brand of cutlery, have just put on the market a new line of ladies' scissors in sizes from 4 to 6½ inches, inclusive, as here illustrated. They have gun metal handles, delicately ornamented with gold. The finish of the handles is absolutely guaranteed by the manufacturers to prevent rust or corrosion. This character of handle can also be furnished in connection with their lines of nail, manicure and lace or embroidery scissors.

## Turner Double Jet Alcohol Globe Blow Pipe.

The Turner Brass Works, 48 North Franklin street, Chicago, Ill., are placing on the market the blow pipe shown in the accompanying illustrations, especially constructed for the consumption of wood alcohol. It is started by pumping a strong pressure into the reservoir by means of the pump contained in the handle, then opening the lower valve and allowing the alcohol to flow into the cup below the burner. The valve is then closed and the alcohol in the cup lighted with a match. Its burning heats the burner sufficiently to generate gas, which is ignited by opening the lower valve again and holding a lighted match in front of the burner. The flame is then regulated by opening the upper valve to the desired extent. Bellows are done away with in using the blow pipe, and the workman is entirely free to manipulate his work, permitting him to leave it temporarily without having to start over again. The manufacturers remark that the extremely high temperature generated by the blow pipe, together with the needle point nonoxidizing flame, combine to make it desirable for use by jewelers, opticians and dentists, as well as electricians and others



*Turner Double Jet Alcohol Globe Blow Pipe.*

who require a hot clean needle flame for fine soldering. A special feature of the device is referred to as being that it replaces the oxyhydrogen blow pipe for lead burning in the connecting of lead storage batteries, and proves the cleanness and nonoxidizing quality of the flame. The blow pipe generates a temperature of over 3000 degrees F., has the capacity to melt pure gold and will also flow 25 per cent. platinum solder and even 50 per cent. solder under favorable conditions. Electricians can use it for telephone switchboard work for soldering fine wires and also for making connections in lead storage batteries, while, it is explained, jewelers and opticians will find it suited to their requirements. The blow pipe is made on the double jet principle, which has been used for several years in connection with the concern's gasoline torches. The blow pipe is nickel plated, weighs 3 pounds packed for shipment, and has a reservoir of 1 pint capacity.

# Current Hardware Prices.

REVISED AUGUST 25, 1903

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued June, 1903, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Abrasives—

Adamite in Carloads:
Crystal ₱ ton $90@100
Grain ₱ ton $120@140
See also *Emery.*

## Adjusters, Blind—

Domestic, ₱ doz. $3.00 33⅓%
North's 10%
Zimmerman's—See *Fasteners, Blind.*

## Window Stop—

Ives' Patent 25&5%
Taplin's Perfection 25&5%

## Ammunition—See *Caps, Cartridges, Shells, &c.*

## Anvils—American—

Arm and Hammer, Wrought ₱ lb 8½@8¾c
Buel Patent Trenton ₱ lb 9½@9¾c
Eagle Anvils ₱ lb 7¼@7¾c
Hay-Budden, Wrought 9@9¼c
Horseshoe brand, Wrought 9@9¼c

## Imported—

Peter Wright & Sons ₱ lb 10½c

## Anvil, Vise and Drill—

Millers Falls Co., $18.00 15&10%

## Apple Parers—See *Parers, Apple, &c.*

## Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz 25%
Smaller Lots 20%
Lots of 3 doz 30%

## Augers and Bits—

*Com. Double Spur* 70&10@75%
*Boring Machine Augers* 66⅔&70%
*Car Bits, 12-in. twist* 60@60&10%
*Jennings' Pattern* 50&10&5@60%
Ford's Auger and Car Bits 40&5%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list 25&10%
No. 30. R. Jenningas' List. 40&7½&10%
Russell Jennings' 25&10&2½%
L'Hommedieu Car Bits 15&10%
Mayhew's Countersink Bits 45%
Millers' Falls 50&10&7½%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 50&10%
Snell's Car Bits, 12-in. twist 60%
Wright's Jennings Bits (R. Jennings' list) 50%

## Bit Stock Drills—

See *Drills, Twist.*

## Expansive Bits—

Clark's small, $18; large, $26 50&10%
Lavigne's Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18 50&10%
C. E. Jennings & Co., Steer's Pat. 25&10%
Swan's 60%

## Gimlet Bits—

*Common Double Cut. gro. $2.75@3.00*
*German Pattern gro. $4.00@4.25*

## Hollow Augers—

*Bonney Pattern, per doz. $10.00@11.00*
Ames 25&10%
New Patent 25&10%
Universal 20%
Wood's Universal 25%

## Ship Augers and Bits—

Ford's 40%
Snell's 40%
C. E. Jennings & Co.:
L'Hommedieu's 15&10%
Watrous' 33⅓&10%

## Awl Hafts, See *Hafts, Awl.*

## Awls—

*Brad Awls:*
*Handled gro. $2.75@3.00*
*Unhandled, Shouldered. gro. 63@66c*
*Unhandled, Patent. gro. 66@70c*
*Peg Awls:*
*Unhandled, Patent. gro. 31@34c*
*Unhandled, Shouldered. gro. 65@70c*
*Scratch Awls:*
*Handled, Common. gro. $3.50@4.00*
*Handled, Socket. gro. $11.50@12.00*
Hurwood 40%

## Awl and Tool Sets—See *Sets, Awl and Tool.*

## Axes—

*First Quality, factory brands $5.50*
*First Quality, jobbers' brands $5.00@5.25*
*Second Quality $4.50@4.75*

## Axle Grease—See *Grease, Axle*

## Axles—

*Iron or Steel*

*Concord, Loose Collar* 4½@5c
*Concord, Solid Collar* 4¾@5½c
*No. 1 Common*
*No. 1 & Com. New Style*
*No. 2. Solid Collar*
*Nos. 11 to 14*
*Nos. 15 to 18*
*Nos. 19 to 22*
} See Trade Report.

## Boxes, Axle—

*Common and Concord, not turned.. lb. 4¼@4½c*
*Common and Concord, turned lb. 5@5½c*
*Half Patent lb. 9@9½c*

## Balances—

Caldwell new list 50%
Pullman's 60%

## Sash—Spring—

*Spring Balances* 60@60&5%
Chatillon's:
Light Spg. Balances 40&10%
Straight Balances 40%
Circular Balances 50%
Large Dial 30%
Pelouze 50%

## Barb Wire—See *Wire, Barb.*

## Bars—Crow—

*Steel Crowbars, 10 to 40 lb., per lb.. 3@3½c*

## Towel—

No. 10 Ideal, Nickel Plate ₱ gro. $8.50
No. 20 Ideal, Brass Finish ₱ gro. $8.50

## Baskets—

Hoffman's Brick Baskets each $3.25

## Beams, Scale—

*Scale Beams, List Jan. 12, '82.40&10%*
Chattillon's No. 1 30%
Chattillon's No. 2 40%

## Beaters—Egg—

Lightning Chain, ₱ doz, $1.15; ₱ gro. $12.00
National Mfg. Co.: ₱ gro.
No. 1 Dover, Family size $7.00
No. 2 Dover, Hotel size 14.00
Taplin Mfg. Co.: ₱ gro.
No. 60 Improved Dover $6.50
No. 75 Improved Dover $7.50
No. 75-2 Imp'd Dover, Tin'd $9.00
No. 100 Improved Dover $8.00
No. 102 Improved Dover, Tin'd $9 50
No. 150 Improved Dover, Hotel $15.00
No. 152 Imp'd Dover, Hotel, T'd $17.00
No 200 Imp'd Dover Tumbler $9.00
No. 202 Imp'd Dover Tumbler, Tin'd $10.00
No. 300, Imp'd Dover Mammoth, ₱ doz $27.00
Wonder (S. S. & Co.) ₱ gro. $6.00

## Bellows—

*Blacksmith, Standard List. 75@75&5%*

## Blacksmiths'—

*Net Prices.*

| *Inch..* | *30* | *32* | *34* | *36* | *38* | *40* |
|---|---|---|---|---|---|---|
| *Each..* | *$3.50* | *3.75* | *4.25* | *4.80* | *5.35* | *6.15* |

*Extra Length:*
*Each..$4.00 4.55 5.10 5.60 6.40 7.50*

## Molders—

| *Inch* | *10* | *12* | *14* |
|---|---|---|---|
| *Doz* | *$8.50* | *10.00* | *13.00* |

## Hand—

| *Inch* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|
| *Doz* | *$4.25* | *4.50* | *5.00* | *6.50* | *7.75* |

## Bells—Cow—

*Ordinary goods 75&5@75&10%*
*High grade 70&10@70&10&5%*
Jersey 75&10%
Texas Star 50%

## Door—

Abbe's Gong 45%
Barton Gong 55%
Home, R. & E. Mfg. Co.'s 55&10%
Lever and Pull, Sargent's 60&10&10%
Yankee Gong 55%

## Hand—

*Hand Bells, Polished. 60&5@60&10%*
*White Metal 55@55&10%*
*Nickel Plated 50@50&5%*
*Swiss 60@60&7½%*
Cone's Globe Hand Bells 33⅓@33⅓&10%
Silver Chime 33⅓@33⅓&10%

## Miscellaneous—

*Farm Bells lb. 2@2½c*
*Steel Alloy Church and School 60%*
American Tube & Stamp'g Co. Gongs 75%
Trip Gong Bells 55&10@60%

## Belting—Rubber—

*Agricultural (Low Grade) 75@75&5%*
*Common Standard 70@70&10%*
*Standard 65@70%*
*Extra 60&5@60&10%*
*High Grade 59&5@59&10%*
Boston Belting Co.:
Seamless Stitched Imperial 45&5%
Boston 50&5%
Niagara 60&5%

## Leather—

*Extra Heavy, Short Lap 60@60&5%*
*Regular Short Lap 60&10@60&10&10%*
*Standard 70@70&5%*
*Light Standard 70&10%*
*Cut Leather Lacing 60&10%*
*Leather Lacing Sides, per sq. ft. 18c*

## Bench Stops—See *Stops, Bench*

## Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

## Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

## Blocks—Tackle—

*Common Wooden 70&10@75&5%*
Hollow Steel Blocks, with Ford's Patent Sheaves 50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron 50&10%
See also *Machines, Hoisting.*

## Boards Stove—

*Zinc, Crystal, &c. 30&10@40&10%*

## Bolts—

## Carriage, Machine, &c.—

*Common Carriage 60&10&10@70%*
*Phila. Eagle, $3.00 list May 24, '99 80@80&5%*
*Bolt Ends. list Feb. 14, '95. 65&5@65&10%*
*Machine, list Oct. 1, '99. 65@65&5%*
*Machine with C & T. Nuts. 60@2½@..%*

## Door and Shutter—

*Cast Iron Barrel, Round Brass Knob:*

| *Inch* | *3* | *4* | *5* | *6* | *8* |
|---|---|---|---|---|---|
| *Per doz* | *$0.26* | *.30* | *.39* | *.47* | *.65* |

*Cast Iron Spring Foot:*

| *Inch* | *6* | *8* | *10* |
|---|---|---|---|
| *Per doz* | *$1.00* | *1.25* | *1.75* |

*Cast Iron Chain, Flat, Japanned:*

| *Inch* | *6* | *8* | *10* |
|---|---|---|---|
| *Per doz* | *$0.75* | *1.05* | *1.30* |

*Cast Iron Shutter, Brass Knobs:*

| *Inch* | *6* | *8* | *10* |
|---|---|---|---|
| *Per doz* | *$0.57* | *.80* | *1.00* |

*Wrt Barrel, Jap'd. 75&10@75&10&10%*
*Wrought " Bronzed. 50&5@50&10%*
*Wrought Flush. B. K.. 50&10@60&10%*
*Wrought Shutter.. 40&10&10@60&5%*
*Wrought Square Neck 50@50&10%*
*Wrought Sunk, Flush 50@50&10%*
Ives' Patent Door 60%

## Stove and Plow—

*Plow 60@60&5%*
*Stove 30@30&10%*

## Tire—

*Common 72½@72½&10%*
*Norway Iron 80@50&5%*
American Screw Company:
Norway Phila., list Oct. 16, '84 80%
Eagle Phila., list Oct. 16, '84 82½%
Bay State, list Dec. 28, '99 72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 80%
Eagle Phila., list Oct. 16, '84 82½%
Eclipse, list Dec. 28, '99 72½%
Russell, Burdsall & Ward Bolt & Nut Co.
Empire, list Dec. 28, '99 72½%
Norway Phila., list Oct. '84 80%
Upson Nut Co.:
Tire Bolts 72½%

## Borers, Tap—

*Borers Tap, Ring, with Handle:*

| *Inch* | *1¼* | *1⅝* | *1¾* | *2* |
|---|---|---|---|---|
| *Per doz* | *$4.30* | *5.00* | *5.75* | *7.25* |
| *Inch* | | | *2¼* | *2½* |
| *Per Doz* | | | *$8.65* | *11.50* |

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each 25%

## Boxes, Mitre—

C. E. Jennings & Co. 25&10%
Langdon 15&10%
Schatz 40%

## Braces—

NOTE.—*Most Braces are sold at net prices.*
*Common Ball, American..$1.15@1.25*
Barber's 50&10&10@60&10%
Fray's Genuine Spofford s. 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 60%
C. E. Jennings & Co. 50&5&10%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Patent. 50%
Millers Falls Drill Braces 25&10%
P. S. & W. Co. Peck's Patent 60&10@65%

## Brackets—

*Wrought Steel 80@80&5%*
Bradley's Wire Shelf:
Full cases 80&10&10%
Broken cases 80&10%
Griffin's Pressed Steel 80%
Griffin's Folding Brackets 70&10%

## Bright Wire Goods—See *Wire and Wire Goods.*

## Broilers—

Wire Goods Co. 75@75&10%

## Buckets, Well and Fire—See *Pails*

## Bucks Saw—

Hoosier ₱ gro. $36.00

## Bull Rings—See *Rings, Bull.*

## Butts—Brass—

*Wrought list Sept., '96. 30@30&10%*
Cast Brass, Tiebout's 50%

## Cast Iron—

*Fast Joint, Broad 60@50&10%*
*Fast Joint, Narrow 50@50&10%*
*Loose Joint 70&5@70&10%*
*Loose Pin 70&5@70&10%*
*Mayer's Hinges 70&5@70&10%*
*Parliament Butts 70&5@70&10%*

## Wrought Steel—

*Table and Back Flaps 75%*
*Narrow and Broad 75%*
*Inside Blind 75&10%*
*Loose Pin 75&10%*
*Loose Pin, Ball and Steeple Tip 60&5%*
*Japanned, Ball Tip Butts 70&10%*
*Bronzed Wrt. Nar. and Inside Blind Butts 55&10%*
*Extra 10@10&10%*

## Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series 5%
1200 series 33⅓%
200, 300, 600 and 900 series 40&10%
Hendryx Bronze:
700, 800 series 40&10%
Hendryx Enameled 40&10%

## Calipers—See *Compasses.*

## Calks, Toe and Heel—

*Blunt, 1 prong ..per lb. 4@4¼c*
*Sharp, 1 prong ..per lb. 4¼@4¾c*
Perkins' Blunt Toe ₱ lb 3½¢
Perkins' Sharp Toe ₱ lb 4 ¢

## Cannons—

Breech Loading, 32 cal. Cartridge, Toy Cannons ..per doz. $2.00

### Can Openers—See *Openers, Can*

### Cans, Milk—

| | 5 | 8 | 10 gal. | |
|---|---|---|---|---|
| Illinois Pattern. | $1 50 | 2.00 | 2.25 | each. |
| Iowa Pattern... | .... | 2.35 | 2.50 | each. |
| | 20 | 30 | 40 | qts. |
| New York Patt'rn | 1.65 | 2.40 | 2.75 | each. |
| Baltimore Patt'rn | .... | 1.80 | 2.00 | each. |

### Cans, Oil—

Buffalo Family Oil Cans:

| 3 | 5 | 10 gal. |
|---|---|---|
| $48.00 | 60.00 | 120.00 gro |

### Caps—Percussion—

*Eley's E. B.*.....60c
*G. D*.....*per M* 34@35c
*F. L*.....*per M* 40@45c
*G. E*.....*per M* 50@51c
*Musket*.....*per M* 62@63c

### Primers—

*Berdan Primers, $1.00 per M*.....5%
*B. L Caps (Sturtevant Shells) $1.00 per M*.....5%
*All other primers per M.$1.22@$1.27*

### Cartridges—

*Blank Cartridges:*
*22 C. F., $5.50*.....10c&5%
*38 C. F., $7.00*.....10c&5%
*22 cal. Rim, $1.50*.....10c&5%
*32 cal. Rim, $2.75*.....10c&5%
*B. B. Caps, Con., Ball Swgd*.....$1.90
*B. B. Caps, Round Ball*.....$1.49
*Central Fire*.....25%
*Target and Sporting Rifle*.....15c&5%
*Primed Shells and Bullets*.....15c&10%
*Rim Fire Sporting*.....50%
*Rim Fire, Military*.....15c&5%

### Cases, Show—

Sun, No. 102, Silent Salesman, 6 ft., $25.00

### Casters—

*Bed*.....70@70c&10%
*Plate*.....60@60c&5%
*Philadelphia*.....75@75c&10%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Martin's Patent (Phœnix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%

### Cattle Leaders—

See *Leaders, Cattle.*

### Chain, Coil—

*American Coil, Jobbers' Shipments:*

| 3-16 | ¼ | 5-16 | ⅜ | 7-16 | ½ | 9-16 |
|---|---|---|---|---|---|---|
| 8.50 | 5.50 | 4.50 | 4.00 | 3.80 | 3.70 | 3.65 |
| ⅝ | ¾ | ⅞ | 1 to 1¼ inch. | | | |
| 3.60 | 3.55 | 3.50 | 3.45 | per 100 lb. | | |

*German Coil*.....60&10c&10%

### Halters and Ties—

*Halter Chains*.....60c&10@60c&10c&10%
*German Halter Chains, list July 24, '97*.....60c&10&10@70c&10%
*Cow Ties*.....60@60c&10%

### Trace, Wagon, &c.—

*Traces, Western Standard: 100 pair*
6½—6-3, *Straight, with ring*...$26.00
6½—6-2, *Straight, with ring*..$26.50
6½—8-2, *Straight, with ring*..$30.00
6½—10-2, *Straight, with ring*..$35.00
*Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.*
*Trace, Wagon and Fancy Chains*..60@60c&10%

### Miscellaneous—

*Jack Chain, list July 10, '93:*
*Iron*.....60c&10@60c&10c&10%
*Brass*.....60c&10@60c&10c&10%
*Safety Chain*.....70c&10@75c&5%
*Gal. Pump Chain*.....*lb.* 4½@4¾c
Covert Mfg. Co.
Breast.....40&2%
Halter.....40&2%
Heel.....40&2%
Rein.....40&2%
Stallion.....40&2%
Covert Sad. Works:
Breast.....70%
Halter.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. Coil and Halters.....40@45&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halter.....45@50&5%
Niagara Coil and Halters.....45&50&5%
Niagara Cow Ties.....45&5@50&10&5%
Wire Dog Chains.....45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl-Jointed Chain.....50%

### Chalk—(From Jobbers.)

*Carpenters' Blue*.....*gro.* 40c
*Carpenters', Red*.....*gro.* 35c
*Carpenters', White*.....*gro.* 30c
*See also Crayons.*

### Checks, Door—

Bardsley's.....45%
Columbia.....50&10%
Eclipse.....60%

### Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemens' Chests, with Tools.....30%
Farmers', Carpenters', etc., Chests, with Tools.....30%
Machinists' and Tipp Fitters' Chests, Empty.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

### Chisels—Socket Framing and Firmer

*Standard List*.....70@70c&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60&10%
C. E. Jennings & Co. Socket Framing No. 15.....60&10%
Swan's.....70%
L. & I. J. White.....30@30&5%

### Tanged—

*Tanged Firmers*.....40c&5@40&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181.....16⅔&10%
L. & I. J. White, Tanged.....25&5%

### Cold—

*Cold Chisels, good quality.lb. 13@15c*
*Cold Chisels, fair quality..lb. 11@12c*
*Cold Chisels, ordinary.....lb. 9 @10c*

### Chucks—

Beach Pat., each $8.00.....35&5%
Pratt's Positive Drive.....25%
Empire.....25%
Blacksmiths'.....25%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard.....30%
Drill Chucks, New Model.....25%
Independent Lathe Chucks.....40%
Improved Planer Chucks.....25%
Universal Lathe Chucks.....40%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....40%
Czar Drill.....30%
Geared Scroll.....30%
Independent.....40%
Union Drill.....30%
Universal.....40%
Face Plate Jaws.....35%
Wescott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....40%
Little Giant Double Grip Drill.....40%
Little Giant Drill, Improved.....40%
Oneida Drill.....40%
Scroll Combination Lathe.....40%

### Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co.....50%
Carriage Makers' Sargent's.....60%
Besly, Parallel.....33⅓&10%
Linemans, Utica Drop Forge & Tool Co 40%
Saw Clamps, see *Vises, Saw Filers'.*

### Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....40%

### Sidewalk—

Star Socket, All Steel....₱ dos. $4.05 net
Star Shank, All Steel....₱ dos. $3.24 net
W. & C. Shank, All steel, 7½ in. ₱ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

### Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓&33⅓&10%
P., S & W.....50&10&5%
L. & I. J. White.....30%

### Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse.....$8.75
1902 Chicago Horse.....$10.75
Lightning Belt.....$15.00
Chicago Belt.....$20.00
Stewart's Patent Sheep.....$13.50
} 15%

### Clips, Axle—

*Eagle and Superior ¼ and 5-16 inch*.....70c&10%
*Norway, ½ and 5-16 inch*..70@70c&10%

### Cloth and Netting, Wire—See *Wire, &c.*

### Cocks, Brass—

*Hardware list:*
*Compression and Plain Bibbs*.....65c&10@70%
*Globe, Kerosene, Racking, &c.. Cocks*.....65c&5@70c&5%

### Coffee Mills—See *Mills, Coffee.*

### Collars, Dog—

Brass, Walter B. Stevens & Son's list.40%
Embossed, Gilt, Walter B. Stevens & Son's list.....30&10%
Leather, Walter B. Stevens & Son's list 40%

### Combs, Mane and Tail—

Covert's Saddlery Works.....60&10%

### Compasses Dividers, &c.

*Ordinary Goods*.....75@75c&5%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
J. Stevens A. & T. Co.....5&10%

### Compressors, Corn Shock—

J. B. Hughes' ₱ doz.....$2.50

### Conductor Pipe, Galva.—

*L. C. L. to Dealers:*

| *Territory.* | *Nested.* | *Not nested.* |
|---|---|---|
| *Eastern*.... | 7½c&12½% | 70c&7½% |
| *Central*.... | 70c&7½% | 70% |
| *Southern*... | 65c&10% | 65c&5% |
| *S. Western*.. | 65c&7½% | 65c&2½% |

*Terms, 2% for cash. With delivery on fruit crates.*
See also *Eave Troughs.*

### Coolers, Water—

| Gal, each. | 2 | 3 | 4 | 6 | 8 |
|---|---|---|---|---|---|
| Labrador | $1.20 | $1.50 | $1.80 | $2.10 | 2.70 |
| Gal. | 3 | 4 | 6 | 8 | |
| Iceland, ea. | $1.80 | $2.10 | $2.40 | $3.00 | |
| Gal., | 2 | 3 | 4 | 6 | 8 |
| Galv. Lined Ea. | $1.85 | $2.00 | $2.25 | $2.90 | $3.90 |

25%

Ga.v. Lined side handles

| Gal. | 2 | 3 | 4 | 6 | 8 |
|---|---|---|---|---|---|
| Each. | $1.95 | $2.15 | $2.40 | $3.15 | $4.15 25% |

### Coopers' Tools—

See *Tools, Coopers'.*

### Cord—Sash—

*Braided, Drab*.....*lb.* 27@28c
*Braided, White, Com*.....*lb.* 19@22c
*Cable Laid Italian..lb. A, 15c; B, 16c*
*Common India*.....*lb.* 10@10½c
*Cotton Sash Cord, Twisted*....16@20c
*Patent Russia*.....*lb.* ..@13c
*Cable Laid Russia*.....*lb.* ..@14c
*India Hemp, Braided*.....*lb* ..@18c
*India Hemp, Twisted*.....*lb.* 12@13c
*Patent India, Twisted*.....*lb.*12@13c

Anniston Cordage Co.:
Old Glory, Nos. 7 to 12.....₱ ℔ 24 ¢
Anniston, Nos. 7 to 12.....₱ ℔ 19 ¢
Old Colony, Nos. 7 to 12.....₱ ℔ 18½¢
Anniston Drab, Nos. to 12.....₱ ℔ 24 ¢
Pearl Braided, cotton, No. 6₱ ℔, 20¢; Nos. 7 to 12, 1½c.
Massachusetts, White.....₱ ℔ 22½¢
Massachusetts, Drab.....₱ ℔ 26½¢
Eddystone Braided Cotton.....₱ ℔ 19¢
Harmony Cable Laid Italian.....₱ ℔ 18¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Phœnix, White.....19¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton.....₱ ℔ 32½¢
Braided, Italian Hemp.....₱ ℔ 32½¢
Braided, Linen.....₱ ℔ 49¢
Braided, White Cotton, Spot.₱ ℔ 28½¢
No. 6 cords, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢.....15%
A quality, White, 35¢.....15%
B quality, Drab, 35¢.....15%
B quality, White, 30¢.....15%
Italian Hemp, 40¢.....15%
Linen, 57½¢.....15%

### Wire, Picture—

*List Oct.,'00*.....85c&10@85c&10c&5%

### Cradles—

*Grain*.....50%

### Crayons—

*White Round Crayons, gross.5½@6c*
*Cases, 100 gro., $4.00, at factory.*
D. M. Steward Mfg. Co.
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
} Case lots 20%
See also *Chalk.*

### Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

### Crow Bars—See *Bars, Crow.*

### Cultivators—

Victor Garden.....50%

### Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847...₱ doz. $3.30
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives.....₱ doz. $3.00
No. 77 Medium Knives.....₱ doz. $2.50

### Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

### Meat and Food—

American.....30%

| Nos. | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Each | $5 | $7 | $10 | $25 | $50 | $60 |

Enterprise.....25@25&7½%

| Nos. | 5 | 10 | 12 | 22 | 32 |
|---|---|---|---|---|---|
| Each | $2 | $3 | $2.75 | $4.50 | $6 |

Dixon's, ₱ doz.....30&10@40%

| Nos. | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | $14.00 | $17.00 | $19.00 | $30.00 |

Home No. 1, ₱ doz. $22.75.....50&10%
Little Giant, ₱ doz.....33⅓&5@40%

| Nos. | 305 | 310 | 312 | 320 | 322 |
|---|---|---|---|---|---|
| | $35.00 | $48.00 | $44.00 | $71.00 | $88.00 |

N. E Food Choppers.....40%
Sterling.....40@40&1 %
No 1....$2.00 each No. 2...$2.50 each
New Triumph No. 605, ₱ doz. 324.00.....30&10@40%
Woodruff's, ₱ doz.....30&10@40%

| Nos. | 100 | 150 |
|---|---|---|
| | $15.00 | $18.00 |

Enterprise Beef Shavers.....25@30%

### Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9, 55%
Kraut Cutters 36 x 12, 40 x 12.....40%
Sterling, $6.00 each.....33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₱ gr....$18@$20
Slaw Cutters, 2 Knife, ₱ gr...$22@$36

### Tobacco—

*All Iron, Cheap*.....*doz. $1.25@$1.50*
Enterprise.....25&50%
National, ₱ doz. No. 1, $21; No. 2, $18..40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's No 12 and 21.....60&10%

### Washer—

Appleton's, ₱ doz. $16.00.....50&10%
Bonney's.....33⅓%

## Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers, ₱ doz.....$6.75
Iwan's Perfection Post Hole Digger, ₱ doz. $8.50
Iwan's Split Handle Post Hole Diggers, ₱ doz.....$7.50
Kohler's Universal.....₱ doz. $15.00
Kohler's Little Giant.....₱ doz. $12.60
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9.00
Kohler's Rival.....₱ doz. $8.50
Kohler's Pioneer.....₱ doz. $7.50
Never-Break Post Hole Diggers, ₱ doz. $24.00.....60%
Samson, ₱ doz. $34.00.....25%

### Dividers—See *Compasses.*

### Doors, Screen—

Phillips', style E, 7x7 in.....₱ doz. $10.50
Phillips', style 077, 7x7 in.....₱ doz. $8.00
Phillips', style x-y, 7x7 in.....₱ doz. $11.00
Porter's Plain, No. 6.....₱ doz. $6 75
Porter's Ornamental, No. 70, ₱ doz. $10.50
Porter's No. 99.....$9.00
Porter's No. 44.....$10.75

### Drawers, Money—

Sun Money Drawers, No. 5, ₱ doz. $
No. 6, with Bell, $10.00; No. 6, with Go
$10.50.
Tucker's Pat. Alarm Till No. 1, ₱ do
$18; No. 2, $15; No. 3, $12; No. 4,

### Drawing Knives—

See *Knives, Drawing.*

### Drills and Drill Stocks—

*Common Blacksmiths' Drill..ea $1.50@$*
Breast, Millers Falls.....15
Breast, P., S. & W.....40
Goodell Automatic Drills..40&5@40&
Johnson's Automatic Drills Nos. 2 an 3.....16⅔&
Johnson's Drill Points.....16⅔&5
Millers Falls Automatic Drills...33⅓&
Ratchet, Curtis & Curtis.....
Ratchet, Parker's.....
Ratchet, Weston's.....
Ratchet, Whitney's, P. S. & W.....
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

### Twist Drills—

*Bit Stock*.....60c&10@60c&10c&10%
*Taper and Straight Shank*.....60c&10@60c&10c&5%

### Drivers, Screw—

*Screw Driver Bits..per doz. ..45@75c*
Balsey's Screw Holder and Driver, ₱ doz. 2¼-inch, $6; 4-in., $7.50 6-in., $9.....40%
Buck Bros' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet.....35%
Goodell's Auto50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21.....25&10%
Millers Falls, Nos. 11, 12, 41, 42.....15c&10%
Never Turn.....60%
New England Specialty Co.....50%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60.....60%
Nos. 20 and 40.....70%
Smith & Hemenway Co.....40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles.....60&10&10%
No. 80.....70@70&10&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

### Eave Trough, Galvanized

| *Territory.* | *L. C. L.* | |
|---|---|---|
| *Eastern*..... | 75c&16⅔% | |
| *Central*..... | 75c&12½% | |
| *Southern*..... | 75c&2½% | |
| *S. Western*..... | 75% | |

*Terms, 2% for cash.*
See also *Conductor Pipe and Elbows.*

### Elbows and Shoes—

*Factory shipments*.....60%
Perfect Elbows (S. S. & Co.).....30%

### Emery, Turkish—

| | 4 to 5 inch | 5 to 150 Flour |
|---|---|---|
| *Kegs*.....*lb.* | 5c | 5½c 5¾c |
| *½ Kegs*.....*lb.* | 5½c | 5¾c 5¾c |
| *Kegs*.....*lb* | 5c | 6c |
| *10-lb cans, 10 in case* | 6½c | 7c 6c |
| *10-lb. cans, less than 10* | 10c | 10c 8c |

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

### Extractors, Lemon Juice—See *Squeezers, Lemon.*

### Fasteners, Blind—

Zimmerman's.....50&10%
Walling's.....50%

### Cord and Weight—

Ives.....40%

### Faucets—

*Cork Lined*.....50@50c&10%
*Metallic Key, Leather Lined*.70@70c&10%
*Red Cedar*.....40@40c&10%
*Petroleum*.....70c&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key...60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's No Br nd, Cedar.....50%
John Sommer's Perfection Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....35%
Improved, ¼ and ⅜ inch.....35%
Self Measuring:
Enterprise, ₱ doz. $30.00.....40&10%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $36..40&10%

### Felloe Plates—See *Plates, Felloe.*

### Files—Domestic—

*List revised Nov. 1, 1899.*
*Best Brands*.....70c&5@70c&10c&5%
*Standard Brands*..75c&5@75c&10c&5%
*Second Quality*.....75c&10c&10@80c&5%

### Imported—

*Stubs' Tapers, Stubs' list, July 24, '97*.....%

### Fixtures, Grindstone—

*Net Prices:*

| *Inch*.... | 15 | 17 | 19 | 21 | |
|---|---|---|---|---|---|
| *Per doz.* | $2.85 | 3.00 | 3.50 | 4.00 | 4.75 |

P., S. & W. Co.....30&10@
Reading Hardware Co.....
Sargent's.....60&10&10%
Stowell's Giant Grindstone Hanger, ₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures Light..60&10%

### Fodder Squeezers—See *Compressors.*

**Forks**—*Aug. 1, 1899, list.*
*Hay, 2 tine* ..... 60%
*Hay 3 tine* ..... 60&7½%
*Hay, 4 tine* ..... 66⅔%
*Hay, Header and Baler 3 tine* 60&15%
*Hay, Header and Baler, 4 tine* 66⅔%
*Grain or Barley* ..... 70%
*Manure, 4 tine* ..... 60&10%
*Manure, 5 and 6 tine* ..... 60&20%
*Spading* ..... 70&5%
Extra 5%

Iowa Dig-Eay Potato ..... 65%
Victor, Hay ..... 60&5%
Victor, Manure ..... 60&5%
Victor, Header ..... 66⅔%
Champion, Hay ..... 66⅔%
Champion, Manure ..... 60&20%
Columbia, Hay ..... 60%&5%
Columbia, Manure ..... 70%
Columbia, Spading ..... 70&10%
Hawkeye Wood Barley 4 tine ₱ dos. $5.00; 6 tine, $6.00.
W. & C. Potato Digger ..... 65%
Acme Hay ..... 60&10&7½%
Acme Manure, 4 tine ..... 60&20&10%
Acme Manure, 6 tine ..... 66⅔&10&5%
Dakota Header ..... 65&15&5%
Jackson Steel Barley ..... 65&15&5%
Kansas Header ..... 66⅔&
W. & C. Favorite Wood Barley 4 tine, ₱ doz., $5.00; 6 tine, $6.00
Pisted.—See *Spoons.*

## Fountains, Stock—

Double Dewey ..... ₱ doz. $13.00

## Frames— Saw—

*White, Straight Bar, per doz.* 75@80c
*Red, Straight Bar, per doz* $1.00@$1.25
*Red, Double Brace, per doz.* $1.40@1.50

## Freezers Ice Cream—

| Qts... | 2 | 3 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| Best.. | $1.45 | 1.65 | 1.95 | 2.40 | 3.60 | 4.00 |
| Good | $1.25 | 1.40 | 1.60 | 2.00 | 2.70 | 3.60 |
| Fair.. | $1.00 | 1.10 | 1.30 | 1.75 | 2.30 | 2.9 |

## Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

## Fry Pans—See *Pans, Fry.*

## Fuse—

*Per 1000 Feet.*
*Hemp Fuse* ..... $2.60
*Cotton Fuse* ..... 2.90
*Single Taped Fuse* ..... 3.25
*Double Taped Fuse* ..... 4.20
*Triple Taped Fuse* ..... 5.00
10&25%

## Gates, Molasses and Oil—

*Stebbins' Pattern* ..... 80@80&10%

## Gauges—

*Marking, Mortise, &c.* ..... 50&10@50&10&10%
Chapin-Stephens Co.:
Marking, Mortise, etc. 50&10@50&10&10%
Scholl's Patent ..... 50&10@50&10&10%
Door Hangers ..... 50@50&10%
Fulton's Butt Gauge ..... 30&10%
Stanley R. & L. Co.'s Butt & Babbet Gauge ..... 20@20&10&10%
Wire, Brown & Sharpe's ..... 25%
Wire, Morse's ..... 25%
Wire P., S. & W. Co ..... 30&10%

## Gimlets— Single Cut—

*Nail, Metal, Assorted* ..... gro. $1.40@1.50
*Spike, Metal, Assorted* ..... gro. $2.80@3.50
*Nail, Wood Handled, Assorted* ..... gro. $1.75@2.00
*Spike, Wood Handled, Assorted* ..... gro. $3.25@3.50

## Glass, American Window

*Jobbers' List, Dec. 16, 1902.*
*Single and Double:*
*From store, First Three Brackets* ..... 90&5%
*From store, all sizes above* ..... 90&15%

## Glasses, Level—

Chapin-Stephens Co ..... 60@60&10&10&10%

## Glue—Liquid, Fish—

*Bottles or Cans, with Brush* ..... 25@50%
*Cans (½ pts., pts., qts., ½ gal., gal.)* ..... 25@45%
International Glue Co. (Martin's) ..... 40&10@55%

## Grease, Axle—

*Common Grade* ..... gro. $4.50@5.50
Dixon's Everlasting ..... 10-₱ pails, ea. 85¢
Dixon's Everlasting, in bxs. ₱ doz. 1 ₱ $1.20; 2 ₱ $2.00

## Griddles, Soapstone—

Pike Mfg. Co ..... 33⅓&33⅓&10%

## Grindstones—

Bicycle Emery Grinder ..... $6.50
Bicycle Grindstones, each ..... $2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz. ..... $2.00
Pike Mowe Knife and Tool Grinder, each ..... $6.00
33⅓%
Velox Ball Bearing, mounted, Angle Iron Frames ..... each, $3.25

## Guards, Snow—

Cleveland Wire Spring Co.:
Galv. Steel ₱ 1000 ..... $9..
Copper ₱ 1000 ..... $18.00

## Halters and Ties—

Covert Mfg. Co.:
Web ..... 45&2%
Jute Rope ..... 40&5&5%
Sisal Rope ..... 30&5%
Covert's Saddlery Works:
Web and Leather Halters ..... 70%
Jute and Manila Rope Halters ..... 70%
Sisal Rope Halters ..... 60&20%
Jute, Manila and Cotton Rope Ties ..... 70%
Sisal Rope Ties ..... 60&10%

## Hammers—

### Handled Hammers—

Keller's Machinists' ..... 40&10@40&10&10%
Keller's Farriers ..... 40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 ..... 40@40&10&10%
Nos. Stow & Wilcox ..... 50%
Nyette R. Plumb:
Plumb, A. E. Nail ..... 33⅓&7½@33⅓&10&7½&5%
Engineers' and B. S. Hand ..... 50&7½&5@50&10&7½&5%
Machinists' Hammers ..... 50&5@50&10&5%
Riveting and Tinners' ..... 40&2½@40&10&2½%
Sargent's C. S. New List ..... 40%

## Heavy Hammers and Sledges—

*8 lb. and under* ..... lb. 45c
*8 to 5 lb* ..... lb. 36c
*Over 5 lb* ..... lb. 30c
75@5 to 75 & 10&5%
*Wilkinson's Smiths'* ..... 9½c@10c lb.

## Handles—

## Agricultural Tool Handles—

*Axe, Pick, &c* ..... 45@50&5%
*Hoe, Rake, &c* ..... 60@60&5%
*Fork, Shovel, Spade, &c.:*
*Long Handles* ..... 60%
*D Handles* ..... 50%

## Cross-Cut Saw Handles—

Atkins' ..... 40&5%
Champion ..... 45@45&10%
Disston's ..... 50%

## Mechanics' Tool Handles—

*Auger, assorted* ..... gro. $2.50@$2 75
*Brad Awl* ..... gro. $1.65@$1 75
*Chisel Handles:*
*Apple Tanged Firmer, gro. ass'd.* $2.50@$2.75; large, $3.25@$3.50
*Hickory Tanged Firmer, gro. ass'd* $2.50@$2.75; large, $3.15@$3.25
*Apple Socket Firmer, gro. ass'd,* $2.25@$2.50; large, $3.00@$3.25
*Hickory Socket Firmer, gro ass'd.* $2.00 @ $2.25; large, $2.25 @ $2.50
*Hickory Socket Framing, gro. ass'd.* $3.00@$3.25; large, $3.25@$3.50
*File, assorted* ..... gro. $1.25@$1 35
*Hammer, Hatchet, Axe, &c* ..... 50%
*Hand Saw, Varnished, doz.* 60@70c
*Not Varnished* ..... 55@60c
*Plane Handles:*
*Jack, doz.* 25c; *Jack Bolted* ..55@60c
*Fore, doz.* 35@38c; *Fore, Bolted* .. 70@75c
Chapin-Stephens Co.:
Carving Tool ..... 40@40&10%
Chisel ..... 65@65&10%
File and Awl ..... 65@65&10%
Saw and Plane ..... 40@40&10%
Screw Driver ..... 40@40&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle, ₱ gro ..... $0.35@$1.50

## Hangers—

*Barn Door, New Pattern, Round Groove, Regular:*

| Inch..... | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|
| Single Doz. | $0.85 | 1.20 | 1.50 | 1.90 | 2.30 |

*Barn Door, New England Pattern, Check Back, Regular:*

| Inch ..... | 3 | 4 | 5 | 6 |
|---|---|---|---|---|
| Single Doz. | $1.10 | 1.60 | 2.15 | 2.70 |

Allith Mfg. Co.
Reliable ..... per doz. $15.00
Chicago Spring Butt Co.:
Friction ..... 25%
Oscillating ..... 25%
Big Twin ..... 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door ..... 50%
Elevator ..... 30%
Railroad ..... 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60%
Roller Bearing ..... 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing ..... $4.15
Parlor, Standard ..... $3.35
Parlor, New Model ..... $2.85
Parlor New Champion ..... $2.25
Barn Door, Standard 50&10&10&5%
Covered ..... 50&10&10%
Special ..... 50&10&10&5%
Lawrence Bros.:
Advance ..... 60%
Cleveland ..... 60&10%
Crown ..... 60%
Giant ..... 50&10%
New York ..... 60%
Peerless ..... 60&10%
Sterling ..... 60%
Swing, No. 05 ..... 50&10%
Union, No. 44, $5.00; No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Hinged Hangers, $16 ..... 50%
Meyers' Stayon Hangers 50&10% (net)
C. S. Smith Mfg. Co.:
Lundy Parlor Door ..... 50&10%
Monarch Barn Door ..... 60&10%
Never Jump Hinge ..... 50&10%
Peerless ..... 60&10%
Perfection ..... 70&5%
Phœnix ..... 70&5%
Wagner's Adjustable ..... 70&10%
Warehouse Anti-Friction ..... 60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3 ..... $2.25
Imp'd Wood Track No. 5 ..... $2.25
Imp'd Steel Track No. 7 ..... $2 70
Imp'd Steel Track No. 7 ..... $2.65
Ball B'r'g Steel Track No. 9 ..... $2.50
Ball B'r'g Steel Track No. 10 ..... $2.50
Roller B'r'g Steel Track No. 11 ..... $2.45
Roller B'r'g Steel Track No. 12 ..... $2.40
Ball B'r'g Steel Track No. 13 ..... $2.75
Roller B'r'g Steel Track No. 14 ..... $2 65
Ball B'r'g Trolley Track No. 15 ..40%
Ball Brg Trolley Track No. 19 ..40&5%
Ball Bearing Tandem Trolley Track No. 16 ..... 40%
Silent Adjustable Track No. 18 ..40%
Auto Adjustable Track No. 22 ..40%
Trolley B. D. No. 17 ..... $1.80
Trolley F. D. No. 120 ..... $2.70
Trolley F. D. No. 121 ..... $2.85
Trolley F. D. No. 151 ..... $3.00
Roller Bearing D. D. No. 25 ..70&5%
Roller Bearing U. S. B. D. ..... 70&5%
Anti Friction B. D. ..... 60&10%
Ives' Wood Track No. 1 ..... $2.15
Ives' Imp'd Wood Track No. 2 ..$2.15
Stowell Mfg. and Foundry Co.:
Acme Parlor Ball Bearing ..... 40%
Atlas ..... 60%
Badger Barn Door ..... 50%
Baggage Car Door ..... 50%
Climax Anti-Friction ..... 50%
Elevator ..... 40%
Express ..... 50%
Interstate ..... 60%
Lundy Parlor Door ..... 50%
Magic ..... 50%
Matchless ..... 60%
Nansen ..... 60&10%
Railroad ..... 50%
Street Car Door ..... 50%
Steel, Nos. 300, 404, 500 ..... 40&15%
Stowell Parlor Door ..... 50%
Wild West, Nos. 303, 404, 500 ..... 5%
Zenith for Wood Track ..... 50%
A. L. Swett Iron Works:
Eagle ..... 60&10%
Hylo ..... 50&10%
Perfection ..... 60%
Pilot ..... 50%
Taylor & Boggis Fy Co. 50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing ..... 60&10%
C. J. Roller Bearing ..... 60&10%
Cycle Ball Bearing ..... 50%
Dwarf Ball Bearing ..... 40%
Ives, Wood Track ..... 60&10%
L. T. Roller Bearing ..... 60&10&5%
New Era Roller Bearing ..... 50&10%
O. K. Roller Bearing ..... 60&10&5%
Prindle, Wood Track ..... 60%
Richards' Wood Track ..... 60%
Richards' Steel Track ..... 50&10%
Spencer Roller Bearing ..... 60&10%
Tandem Nos. 1 and 2 ..... 60%
Underwriters' Roller Bearing ..... 40%
Velvet ..... 50%
Wilcox Auditorium Ball Bearing 30%
Wilcox Barn Trolley No. 123 ..... 40%
Wilcox Elv. Door, Nos 112 and 122½ 50%
Wilcox Elv. Door, No. 132 ..... 30%
Wilcox Fire Trolley, Roller Bearing ..... 30%
Wilcox Le Roy Noiseless Ball Bearing ..... 40%
Wilcox New Century ..... 50&10&10%
Wilcox O. K. Steel Track ..... 50%
Wilcox O. K. Trolley ..... 50%
Wilcox Trolley Ball Bearing ..... 40%
Wilcox Wideman Narrow Gauge Ball Bearing ..... 40%
For Track, see *Rail.*
Extra 5&10% often given.

## Hangers, Gate—

Myers' Patent Gate Hangers, ₱ doz., net, $4.50

## Hasps—

McKinney's Perfect Hasp, ₱ doz ..... 50%

## Hatchets—

*Best Brands* ..... 50@50&10%
*Cheaper Brands* ..... 60@60&10%
*Note.—Net prices often made.*

## Hinges—

## Blind and Shutter Hinges—

*Surface Gravity Locking Blind: (Victor; National; 1868 O P Niagara; Clark's O. P.; Clark's Tip; Buffalo.)*

| No. | 1 | 3 | 5 |
|---|---|---|---|
| Doz. pair | $0.85 | 1.75 | 3.50 |

*Mortise Shutter: (L. & P., O. S., Dixie, &c.)*

| No. | 1 | 1½ | 2 | 2½ |
|---|---|---|---|---|
| Doz. pair | $0.70 | .65 | .60 | .55 |

*Mortise Reversible Shutter, (Buffalo, &c.)*

| No. | 1 | 1½ | 2 |
|---|---|---|---|
| Doz. pair | $0.75 | .70 | .65 |

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Parker ..... 70@75%
Reading's Gravity ..... 75&10%
Sargent's, Nos. 1, 3, 5, 11 & 13 ..... 70&10@70&20%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.80 with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter ..... 7 &5%
Acme, Lull & Porter ..... 75%
Queen City Reversible ..... 75%
Stenger's Positive Locking, Nos. 1 & 3 ..... 70&10%
Shepard's Noiseless, Nos. 60, 65, 55 ... 70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75%
1868, Old Pat'n, Nos. 1, 3 & 5 ..... 75%
Tip Pat'n, Nos. 1, 3& 5 ..... 75%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75%
Shepard's Double Locking, Nos. 20 & 25 ..... 70%
Champion Gravity Locking, No. 75..75%
Steamboat Gravity Locking, No. 10. 75%
Pioneer, Nos. 000, 45 & 55 ..... 75%
Empire, Nos. 101 & 103 ..... 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

## Gate Hinges—

*Clark's or Shepard's—Doz. sets:*

| No. | 1 | 2 | 3 |
|---|---|---|---|
| Hinges with Latches | $1.00 | 2.70 | 5.00 |
| Hinges only | $1.50 | 2.05 | 3.80 |
| Latches only | .70 | .70 | .35 |

*New England:*
*With Latch* ..... doz. ....@$2.50
*Without Latch* ..... doz. ....@$1.80
*Reversible Self-Closing:*
*With Latch* ..... doz. ....@$1.80
*Without Latch* ..... doz. ....@$1.45
*Western:*
*With Latch* ..... doz. $1.80
*Without Latch* ..... doz. $1.30
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

| No. | 1 | 2 | 3 |
|---|---|---|---|
| Hinges with Latches | $2.00 | 2.70 | 5.00 |
| Hinges only | 1.40 | 2.05 | 3.80 |
| Latches only | .70 | .70 | 1.35 |

## Spring Hinges—

*Holdback, Cast Iron* ..... gro. $9.00
*Non-Holdback, Cast Iron* ... gro. $8.00
J. Bardsley
Bardsley's Patent Checking ..... 15%
Bardsley's Patent Non-Checking 45%
Bommer Bros.:
Bommer Ball Bring Floor Hinges 40%
Bommer Spring Hinges ..... 40%
Chicago Spring Butt Co.:
Chicago Spring Hinges ..... 25%
Triple End Spring Hinges ..... 50%
Chicago (Ball Bearing) Floor Hinge ..... 50%
Garden City Engine House .. 25%
Keene's Saloon Door ..... 25%
Columbian Hdw. Co.:
Acme, Wrt. Steel ..... 30%
Acme, Brass ..... 25%
American ..... 30%
Columbia, No. 14 ..... ₱ gr. $9.00
Columbia, No. 18 ..... ₱ gr. $25.00
Columbia, Adjustable, No. 7 ₱ gr. $12.00
Gem, new list ..... 30%
Clover Leaf ..... ₱ gr. $12.50
Oxford, new list ..... 30%
Hoffman Hinge & Foundry Co.:
No. 70 & 80 Holdback Detachable $9.50
Lawson Mfg. Co.:
Matchless ..... 35%
Matchless Pivot ..... 45%
Shelby Spring Hinge Co.:
Crown Jamb Hinge ..... 40%
Chief Ball Bearing Floor Hinge. 45%
Royal Ball Bearing Floor Hinge. 45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr $12.50
Ideal, No. 4 ..... ₱ gr. $9.00
New Idea No. 1 ..... ₱ gr. $9.00
New Idea, Double Acting ..... 45%
Extra 10% often given on most of these Hinges.

## Wrought Iron Hinges—

*Strap and T Hinges, &c., list Mar. 15, 1901:*
*Light Strap Hinges* ..... 80&7½%
*Heavy Strap Hinges* 80&20&10%
*Light T Hinges* ..... 75&10&5%
*Heavy T Hinges* ..... 75&5%
*Extra Heavy T Hinges* ..80&25%
*Hinge Hasps* ..... 70%
*Cor. Heavy Strap* ....80&20&10%
*Cor. Ex. Heavy T* ..... 80&20
Ex 10@10&10%

*Screw Hook and Strap.*
*6 to 12 in* ..... lb. 3½c
*14 to 20 in* ..... lb. 3½c
*22 to 36 in* ..... lb. 3 c

*Screw Hook and Eye:*
*¾ to 1 inch* ..... lb. 6 c
*⅝-inch* ..... lb. 7 c
*½-inch* ..... lb. 9 c

## Miscellaneous—

Hoffman's Steel Spring Butt Hinges .... 40&10%
Hoffman's Offset Refrigerator Hinges .. 40&10%

## Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers ..... 35%

## Hods, Coal—

| | 15 | 16 | 17 | 18 inch. |
|---|---|---|---|---|
| Galv. Open.. | $2.50 | 2.75 | 3.00 | 5.25 ₱ doz. |
| Jap. Open... | $2.00 | 2.25 | 2.50 | 2.75 ₱ doz. |
| Galv. Fun'el. | $3.00 | 3.25 | 3.50 | 3.75 ₱ doz. |
| Jap. Funnel. | $2.50 | 2.75 | 3.00 | 3.25 ₱ doz. |

## Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar ..... each $1.45
Steel Brick ..... each $1.10
Hoffman's:
Brick ..... each $1.10
Masons' ..... each $3.00
Plasterers' ..... each $3.20

## Hoes— Eye—

*Scovil and Oval Pattern* ..... 60&10@60&10&10%
*Grub, list Feb. 23, 1899* ..... 60&10@60&10&5%

## Handled—

*Aug. 1, 1899, List:*
*Garden* ..... 70&10%
*Meadow & Rhode Island* 75&7½%
*Southern Meadow* ...75&5&2½%
*Mortar and Street* ..... 75&7½%
*Planters', Regular Pat'n.* 70&30%
*Cotton* ..... 75&7½%
*Toy, Ladies', Boys', Onion, Turnip, Berry or Tobacco.* 70&10&5%
Extra 80%

*Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.*

Ft. Madison Cotton Hoe ..... 75&7½%
Ft. Madison Crescent Cultivator Hoe, per doz ..... 75&10%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₱ doz. $5.00
Junior Size ..... ₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4 60
Ft. Madison Dixie Tobacco Hoe. 75&20%
Kretsinger's Cut Easy ..... 70&10%
Warren Hoe ..... 60%
W. & C. Ivanhoe ..... 75&2%
B. B. Cultivator Hoe ..... 75&10&2%
Acme Weeding ..... 75&10&2%
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

## Hoisting Apparatus—

See *Machines, Hoisting.*

## Holders— Bit—

Angular, ₱ doz. $24.00 ..... 45&10%

## Door—

Empire ..... 30%
Bardsley's ..... 45%

## File and Tool—

Nicholson File Holders and File Handles ..... 33⅓%

## Hooks— Cast Iron—

Bird Cage, Reading ..... 60%
Bird Cage, Sargent's List ..... 60%
Ceiling, Sargent's List ..... 40&10%
Clothes Line, Hoffman's ..... 40&10%
Clothes Line, Reading List ..... 65&10@65&10&10%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List ..... 45&10%
Clothes Line, Stowell's ..... 70%
Coat and Hat, Stowell's ..... 70%
Coat and Hat, Reading ..... 70&75%
Coat and Hat, Wrightsville ..... 65%
Harness, Hoffman ..... per doz. 35&40¢
Harness, Reading List ..... 70&10&75%

## Wire—

*Belt* ..... 80@80&5%
*Wire C. & H. Hooks* ..... 70@70&5%
Atlas, Coat and Hat:
Single Cases ..... 50%
10 Case Lots ..... 50&10%
Czar Harness ..... 50&10&5%

Wire Coat and Hat:
Acme....60%
B. B....60%
V Brace, Chief and Czar....60%
Gem....60&10%
Bright Wire Goods—See *Wire.*

### Wrought Iron—

*Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.*
*Cotton....doz. $1.05@1.25*
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

### Miscellaneous—

*Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50*

| *Grass....Nos.* | *1* | *2* | *3* | *4* |
|---|---|---|---|---|
| *Best* | $1.50 | 1.75 | 2.00 | |
| *Common* | $1.30 | 1.30 | 1.40 | 1.60 |

*Potato and Manure....66⅔&20%*
*Whiffletree....lb. 5¾@6c*
*Hooks and Eyes:*
*Brass....60c&10c&10@70%*
*Malleable Iron....70c&5@70c&10%*
Covert Saddlery Works' Self Locking Gate and Door Hook....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $5.25 net
Bench Hooks—See *Bench Stops.*
Corn Hooks—*See Knives. Corn.*

### Horse Nails—See *Nails, Horse*

### Horseshoes—

See *Shoes, Horse.*

### Hose Rubber—

*Garden Hose, ¾-inch:*
*Competition....ft. 4½@ 5 c*
*3-ply Standard....ft. 6½@ 7 c*
*4-ply Standard....ft. 7½@ 8 c*
*3-ply extra....ft. 8½@ 9 c*
*4-ply extra....ft. 10 @10½c*
*Cotton Garden, ¾-in., coupled:*
*Low Grade....ft. 6 @7 c*
*Fair quality....ft. 8 @9 c*

## Irons—

### Sad—

*From 4 to 10....lb 3@3¼c*
*B. B. Sad Irons....lb. 3@3¼c*
*Chinese Laundry....lb. 4¾@5c*
*Chinese Sad....lb. 3¾@4c*
*Mrs. Potts', per set:*

| *Nos....* | *50* | *55* | *60* | *65* |
|---|---|---|---|---|
| *Jap'd Tops* | 7¼c | 7¼c | 8¼c | 8¼c |
| *Tin'd Tops* | 7¼c | 7¼c | 8¼c | 8¼c |

*New England Pressing, lb..3½@3¾c*

### Pinking—

*Pinking Irons....doz. 50@60c*

### Soldering—

*Soldering Coppers 2½ and 3..20@21c*
*1½ and 2....22@23c*

### Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw....30&5%
Steel....45&2%
Covert's Saddlery Works':
Daisy....60&10%
Victor....60&10%
Lockport....50%
Lane's Steel....30&10%

## Kettles—

*Brass, Spun, Plain....20@25%*
Enameled and Cast Iron—See *Ware, Hollow.*

### Knives—

### Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c....30%
Hartzell Cutlery Co....50%
Smith & Hemenway Co....40&10%
Hay and Straw—See *Hay Knives.*

### Corn—

Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

### Drawing—

*Standard List....70&5@70c&10%*
Bradley's....
C. E. Jennings & Co. Nos. 45, 46...60&10%
Jennings & Griffin, Nos. 51, 52...60&10&10%
Swan's....70&10&2½%
Watrous....16⅔&10%
L. & I. J. White....20&5@25%

### Hay and Straw—

Lightning....₱ doz. $6.50@7.00
Iwan's Sickle Edge....₱ doz. $10.00
Iwan's Serrated....₱ doz. $10.00
Maine....₱ doz. $8.50

### Mincing—

Buffalo....₱ gro. $13.00

### Miscellaneous—

*Farriers'....doz. $2.00@3.00*
Wostenholm's....₱ dos. $3.00@3.25

### Knobs—

*Base, 2¼-inch, Birch, or Maple, Rubber tip, gro....$1.05@1.10*
*Carriage, Jap, all sizes..gro. 25@30c*
*Door, Mineral....doz. 65@70c*
*Door, Por. Jap'd....doz. 70@75c*
*Door, Por. Nickel....doz. $2.05@2.15*
Bardsley's Wood Door, Shutter, &c...15%
Picture, Sargent's....60&10%

## Lacing Leather—

See *Belting Leather—*

### Ladders, Step, Etc.—

Lane's Store....25%
Myers Noiseless Store Ladders....50%

### Ladies—Melting—

L. & G. Mfg. Co....25%
P. S. & W....50%
Reading....60%
Sargent's....45&10%

### Lanterns—Tubular—

*Regular Tubular No. 0..doz. $4.35@4.75*
*Lift Tubular...No. 0..doz. $4.75@5.25*
*Hinge Tubular..No. 0..doz. $4.75@5.25*
*Other Styles....40c&10@40c&10c&5%*

### Bull's Eye Police—

*No. 1, 2¾ inch....$2.50@2.75*
*No 2 3 inch....$2.75@3.00*

### Latches—Gate—

Hoffman's Safety Gate....₱ doz. 60c

### Thumb—

*Roggin's Latches, with screw..dz 35@40c*

### Leaders, Cattle—

*Small....doz. 55c; large, 60c*
Covert Mfg. Co....15&2%

### Lifters, Transom—

R & E....33⅓%

### Lines—

| *Wire Clothes, Nos...* | *18* | *19* | *20* |
|---|---|---|---|
| *100 feet* | $2.20 | 2.00 | 1.65 |
| *75 feet* | $1.80 | 1.70 | 1.30 |

Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3....10%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50
₱ gr....30%
Anniston Waterproof Clothes, 50 ft., ₱ gro.: $24.00; Gilt Edge, $22.00; Air Line, $23.00; Acme, $17.00; Alabama, $16.00; Empire, $17.00; Advance, $14.00; Alliston, $13.00; Calhoun, $11.00; Oriole, $20.00; Albermarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $9.00.

### Locks—Cabinet—

*Cabinet Locks....33⅓@33⅓&7½%*

### Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]
Reading Hardware Co....50%
R. & E. Mfg. Co....40%
Sargent & Co....40@40&10%

### Elevator—

Stowell's....40%

### Padlocks—

*Wrought Iron....75c&10c&5@80c&5%*
R. & E. Mfg. Co. Wrt. Steel and Brass....75@75&10%

### Sash, &c.—

Ives' Patent.:
Bronze and Brass....55&7½%
Crescent....50%
Iron....60&2½%
Wrought Bronze and Brass....50&5%
Wrought Steel....55%
Reading....60&10&10@70%

## Machines—Boring—

*Com., Upright, Without Augers..$2.00*
*Com., Angular, Without Augers..$2.25*
Without Augers.

| R. & E. Mfg. Co.: | Upright. | Angular. |
|---|---|---|
| Improved No. 3 | $4.25 | No. 1 $5.00 |
| Improved No. 4 | 3.75 | No. 2 3.38 |
| Improved No. 5 | 2.75 | |
| Jennings'...No. 4 | 3.15 | No. 1, 3.50 |
| Millers' Falls | | 5.75 |
| Snell's, Rice's Pat. | 2.50 | 2.75 |

### Hoisting—

Moore's Anti-Friction Differential Pulley Block....30%
Moore's Hand Hoist, with Lock Brake..20%

### Ice Cutting—

Chandler's....15&10%

### Washing—

| Boss Washing Machine Co.: | Per doz. |
|---|---|
| Boss No. 1; Boss Rotary | $57.00 |
| Boss No. 7; Dietz Rotary | $60.00 |
| Champion Rotary; Banner No. 1 | $54.00 |
| Standard Champion No. 1 | $48.00 |
| Standard Perfection | $26.00 |
| Cinti Square Western | $30.00 |
| Uneeda American, Round | $29.00 |

### Mallets—

*Hickory....45&5@50%*
*Lignumvitæ....45c&5@50%*
*Tinners', Hickory and Applewood, doz....50@55c*

### Mats—Door—

Elastic Steel (W. G. Co.)....10%

### Mattocks—

See *Picks and Mattocks.*

### Menders, Hose

Robinson's Hose Menders....₱ gro, $2.00

### Milk Cans—See *Cans, Milk*

### Mills—Coffee, etc.—

Enterprise Mfg. Co....25@30%
Hoffman's Side, Coffee and Spice....₱ doz. $1.25
National, list Jan. 1, '94....30%
Parker's Columbia & Victoria...50&10c&10%
Parker's Box and Side....50&10c&10%
Sun, No. 1080, 1 ℔ mill....₱ doz. $8.00
Swift, Lane Bros Co....30%

### Mowers, Lawn—

*Net prices are generally quoted.*
*Cheap....all sizes. $1.90@1.95*
*Good....all sizes, $2.25@2.50*

| | *10* | *12* | *14* | *16-inch* |
|---|---|---|---|---|
| *High Grade* | 4.25 | 4.50 | 4.75 | 5.00 |

Continental....60&5%
Great American....70%
Great American Ball Bearing, new list..70%
Quaker City....70%
Pennsylvania....60&5%
Penna. Ivania, Jr., Ball Bearing....60%
Pennsylvania Golf....50%
Pennsylvania Horse....40%
Pennsylvania Pony....45%
Philadelphia:
Styles M., S., C., K., T....70&10%
Style A, all Steel....65&10%
Style E, High Wheel....70&10&5%
Drexel and Gold Coin, low list...50&5%

## Nails—

*Cut and Wire. See Trade Report.*
*Wire Nails and Brads, Papered. List July 20, 1899....85@85c&10%*
*Hungarian, Finishing, Upholsterers', &c. See Tacks.*

### Horse—

| Nos. | 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|
| A. C. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ | 40&5% |
| Ausable | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | 50&10% |
| C. B. K. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ | 40% |
| Champ'n | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | 40&10&5% |
| Clinton | 19¢ | 17¢ | 16¢ | 15¢ | 14¢ | 30&10&5% |
| Maud S. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ | 50% |
| Putnam | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ | 33⅓% |
| Putnam | | | | | | |
| Cold Rol'd | 19¢ | 18¢ | 17¢ | 16¢ | | 10&10% |
| American, Nos. 5 to 10 | ₱ ℔ | | | | | 19@19½¢ |
| Nonouset | Nos, 5 to 10¢ | | | | ₱ ℔ | 12¢ |
| *Jobbers' special brands...per lb. 8@9c* | | | | | | |

### Picture

| | *1½* | *2* | *2¼* | *3* | *3½ in.* |
|---|---|---|---|---|---|
| *Brass Head..* | *.45* | *.60* | *.70* | *.95* | *1.00 gro.* |
| *Por. Head...* | *1.10* | *1.10* | *1.10* | | *... gro.* |

Crown Picture Nails....₱ gro. $1.50

### Nippers, See *Pliers and Nippers.*

### Nuts—

*Cold Punched: Off list.*
*Mfrs. or U. S. Standard.*
*Square, plain....$4.50*
*Hexagon, plain....$4.60*
*Square, C. T. & R....$4.70*
*Hexagon, C. T. & R....$5.00*
*Hot Pressed:*
*Mfrs., U. S. or Nar. Gauge Stan'd.*
*Square Blank....$4.80@5.00*
*Hexagon Blank....$5.00@5.20*
*Square Tapped....$4.60@4.80*
*Hexagon Tapped....$4.80@5.10*

## Oakum—

*Best or Government....lb. 6¼c*
*Navy....lb. 4¾c*
*U. S. Navy....lb. 5¼c*
*Plumbers' Spun Oakum....2¾c*
*In carload lots ¼c lb. off f. o. b. New York.*

### Oil Tanks—See *Tanks, Oil.*

### Oilers—

*Brass and Copper....65@65c&10%*
*Tin or Steel....70c&10@75%*
*Zinc....75@75c&10%*
*Chase or Paragon:*
*Brass and Copper....45c&10@50%*
*Tin or Steel....75@75c&10%*
*Zinc....66@60c&10%*
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans....70&70&10%
Railroad Oilers etc,....60@60&10%

### Openers—Can—

*French....doz. 35c*
*Iron Handle....doz. 25@27c*
*Sprague, Iron Hdle..per doz 35@40c*
*Sardine Scissors...doz. $1.75@$3.00*
Marvel....per doz. $1.25
National....50%
Stowell's....per doz. 35@45¢
Tip Top....per doz. $0.75

### Egg—

Nickel Plate....per doz., $2.25
Silver Plate....per doz., $3.50

## Packing—

*Asbestos Packing, Wick and Rope, 15@15½c lb.*

### Rubber—

*Sheet, C. I....8@12c*
*Sheet, C. O. S....9@13c*
*Sheet, C. B. S....10@14c*
*Sheet, Pure Gum....50@70c*
*Sheet, Red....35@40c*
Jenkins' Standard, ₱ ℔ 80¢....25@25&5%

### Miscellaneous—

*American Packing....7@10c lb.*
*Cotton Packing....14@16c lb.*
*Italian Packing....9@12½c lb.*
*Jute....4c lb.*
*Russia Packing....7@11c lb.*

### Pails—Creamery

S. S. & Co., with gauges.. No 1 $6.25; No. 2, $5.50 ₱ doz.

### Galvanized—

Price per doz.

| *Quart....* | *10* | *12* | *14* |
|---|---|---|---|
| *Water, Regular* | 1.50 | 1.75 | 2.00 |
| *Water, Heavy* | 2.75 | 3.00 | 3.25 |
| *Fire, Rd. Bottom* | 2.30 | 2.60 | 2.80 |
| *Well* | 2.25 | 2.50 | 2.75 |

### Pans—Dripping—

*Standard List....60c&5@60&10%*

### Fry—

*Common Lipped:*

| *No.* | *1* | *2* | *3* | *4* | *5* |
|---|---|---|---|---|---|
| *Per doz.* | $0.95 | 1.05 | 1.15 | 1.30 | 1.65 |

### Roasting and Baking—

Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.25; 20, $5.75; 30, $6.25.
Simplex, ₱ doz.:

| No. | 40 | 50 | 60 | 140 | 150 | 160 |
|---|---|---|---|---|---|---|
| | $2.75 | 3.25 | 3.75 | 3.00 | 3.25 | 4.00 |

### Paper—Building Paper—

*Asbestos: lb.*
*Building Felt....2¾c*
*Mill Board, sheet, 40 x 40 inches 3½c*
*Mill Board, roll, thicker than 1-16 inch....3¼c*
*Mill Board, roll, 1-16 in. thick and less....2½c*

*Per roll*

*Rosin Sized Sheathing: 500 sq. ft.*
*Light wt., 25 lbs. to roll...$0.45@0.50*
*Medium wt., 30 lbs. to roll...$0.48@0.55*
*Heavy wt., 40 lbs. to roll...$0.68@0.75*
*Black Water Proof Sheathing, 500 Sq ft., 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.25.*
*Deafening Felt, 9, 6 and 4¼ sq. ft. to lb., ton....$45.00*
*Red Rope Roofing, 250 sq. feet per roll....$1.65*
NOTE.—*These goods are often sold at delivered prices.*

### Tarred Paper.

*1 ply (roll 400 sq ft.), ton..$25 50@37.00*
*2 ply, roll 108 sq. ft....60@65c*
*3 ply, roll 108 sq. ft....85@90c*
*Slater's Felt (roll 500 sq. ft.)....75c*
NOTE.—*Above prices often include delivery.*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.)....$2.75

### Sand and Emery—

*Flint....60@60c&10%*
*Garnet....25@30@15%*

### Parers—Apple—

| | | |
|---|---|---|
| Advance | ₱ doz. | $4.50 |
| Baldwin | ₱ doz. | $3.00 |
| Bonanza Improved | each | $0.50 |
| Dandy | each | $2.50 |
| Eureka Improved | each | $25.00 |
| Family Bay State | ₱ doz. | $15.00 |
| Improved Bay State | ₱ doz. | $36.00 |
| New Lightning | ₱ doz. | $2.50 |
| Reading 72 | ₱ doz. | $4.00 |
| Reading 78 | ₱ doz. | $7.00 |
| Turn Table '98 | ₱ doz. | $0.75 |
| White Mountain | ₱ doz. | $6.00 |

### Potato—

Saratoga....₱ doz. $7.00
White Mountain....₱ doz. $6.00

### Picks and Mattocks—

*List Feb. 23, 1899...60c&10@60c&10c&10%*

### Pinking Irons—

See *Irons, Pinking.*

### Pins—Escutcheon—

*Brass....60@60c&10%*
*Iron, list Nov. 11, '85....60@60c&10%*

### Pipe, Cast Iron Soil—

*Standard, 2-6 in....50c&10%*
*Extra Heavy, 2-6 in....65%*
*Fittings....70%*

### Pipe, Merchant,

*Steel or Iron, Carload Lots.*

| *Merchant Pipe.* | *f. o. b. Pittsburgh. Black.* | *Galvanized.* |
|---|---|---|
| *⅛, ¼, ⅜ inch* | 68% | 58% |
| *½ inch* | 70% | 60% |
| *¾ to 6 inch* | 75% | 65% |
| *7 to 12 inch* | 69% | 59% |

*Less than carloads, 12½% advance.*

### Pipe Sewer—

*Jobbers' Prices—*
*Standard Pipe and Fittings, 2 to 2½ in.*
*New England....70%*
*New York and New Jersey....75%*
*Maryland, Delaware, East Penn. 77½*
*West Penn and West Va....70%*
*Virginia....78%*
*Ohio, Michigan and Ky....78%*
*Carload lots are generally delivered.*

### Pipe, Stove—

Edwards' Nested Stove Pipe:

| | C. L. | L. C. L. |
|---|---|---|
| 5 in., per 100 joints | $7.50 | $8.50 |
| 6 in., per 100 joints | 8.40 | 9.00 |
| 7 in., per 100 joints | 9.00 | 10.00 |

### Planes and Plane Irons—

### Wood Planes—

*Bench, First quality....40c&5@40c&10%*
*Bench, Second qual....50c&5@50c&10%*
*Molding....33½&5@33½c&10%*
Bailey's (Stanley R. & L. Co) 5&10@25&10&10%
Chapin-Stephens Co.:
Bench, First Quality....40@40&10%
Bench, Second Quality....50@50&10%
Molding....33½@33½&10%
Toy and German....40@40&10%
Gage Self Setting....35%
Union....60%

### Iron Planes—

Bailey's (Stanley R. & L. Co) 25&10@25&10&10%
Chaplin's Iron Planes....50&10%
Miscellaneous Planes (Stanley R. & L. Co.)....20&10@20&10&10%
Sargent's....60%
Union....60%

### Plane Irons—

*Wood Bench Plane Irons....30c&5@30c&10%*
Buck Bros....30%
Chapin-Stephens Co....30@30&10%
Stanley R. & L. Co...20&10@20&10&10%
L. & I. J. White....20&5@25%

### Planters, Corn, Hand.

Kohler's Eclipse....₱ doz. $8.50

### Plates—

*Felloe....lb. 3½@4c*
Self-Sealing Pie Plates (S. S. & Co.), ₱ dos. $2.00....50%

### Pliers and Nippers—

*Button Pliers....75@75c&10%*
*Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45*

| *Gas Pipe..* | *7* | *8* | *10* | *12-in.* |
|---|---|---|---|---|
| | $1.75 | $2.00 | $2.75 | $3.75 |

Acme Nippers....50@50&5%
Bernard's:
Parallel, Pliers....95%
Paragon Pliers....50&5%
Lodi Pliers....50&5%
Elm City Fence Pliers....35%
Cronk & Carrier Mfg. Co.:
American Button....75&10%
Cronk's....60%
Improved Button....70&10%
Stub's Pattern....50%
Combination and others....33⅓%
Heller's Farriers' Nippers, Pincers, and Tools 40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers, 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds....40%

### Plumbs and Levels—

Chapin Stephens Co.:
Plumbs and Levels....30@30&10&10%
Chapin's Imp. Brass Cor....40@40&10&10%
Pocket Levels....30@30&10&10%
Level Glasses....60@60&10&10%
Disston's Plumbs and Levels....20%
Disston's Pocket Levels....20%
C. E. Jennings & Co.'s Iron....30&10%
C. E. Jennings & Co.'s Iron, Adjustable....30&10%
Stanley R. & L. Co...20&10@30&10&10%

Stanley's Duplex.....20@20&10&10%
Woods' Extension.....33⅓%

## Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No. 2, $ .00; No. 3, $.00; No. 4, $12.00.....50%

## Points, Glaziers'—

*Bulk and 1 lb. papers.. lb. 8½c@..*
*¼-lb. papers..... lb. 9½c@..*
*¼-lb. papers..... lb. 9½c@..*

## Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

## Police Goods—

*Manufacturers' Lists.....25@25&5%*
Tower's.....35%

## Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz.....$2.00

## Stove—

Black Eagle Benzine Paste, 5 lb cans... ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gro. $9.00
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ lb 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, ½ pt. cans..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....₱ doz. $1.00
Black Silk, 5 oz. box.....₱ doz. $0.75
Black Silk, ½ pt. liq.....₱ doz. $1.00

## Poppers, Corn—

*1 qt., Square.....gro. $9.00*
*1 qt., Round.....gro. $10.00*
*1½ qt., Square.....gro. 11.00*
*2 qt., Square.....gro. 13.00*

## Post Hole and Tree Augers and Diggers—

see also *Diggers, Post Hole, &c.*

## Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts, each.....$1.30

## Potato Parers—

See *Parers, Potato.*

## Pots— Glue—

*Enameled.....40%*
*Tinned.....5%*

## Powder—

*In Canisters:*
*Duck, 1 lb. each.....45c*
*Fine Sporting, 1 lb. each.....75c*
*Rifle, ½-lb. each.....15c*
*Rifle, 1-lb. each.....25c*
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

| King's Smokeless: | Shot Gun | Rifle |
|---|---|---|
| Keg (25 lb bulk) | $12 00 | $15.00 |
| Half Keg (12½ lb bulk) | 6.25 | 7.75 |
| Quarter Keg (6¼ lb bulk) | 3.25 | 4.00 |
| Case 24 (1 lb cans bulk) | 14.00 | 17 00 |
| Half case 12 (1 lb cans blk) | 7.25 | 8 75 |

Robin Hood shot Gun.....50&20%

## Presses—

### Fruit and Jelly—

Enterprise Mfg. Co.....30@25%
Sensible.....33⅓%
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

### Seal Presses—

Morrill's No. 1, per doz. $20.00.....50%
Morrill's No. 2, per doz. $22 50.....50%

## Pruning Hooks and Shears—See *Shears.*

## Pullers Nail—

Cyclops.....50%
Miller's Falls, No. 3, per doz. $12.00.....33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $37.50.....50%
Pelican, ₱ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 1 (large), ₱ doz. $6.50; No. 2 (large), $5.75; No 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $5.00; No. 2-D (large), $4.50; No 3-D (small) $4.00.
Smith & Hemenway Co.:
Ajax.....60%
Diamond B, No. 2, case lots, ₱ doz $6.00
Diamond B, No. 3, case lots, ₱ doz $5.50
Eureka.....50%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15.....40%
Yankee.....66⅔%

## Pulleys—Single Wheel—

| *Inch* | *2* | *2¼* | *3* |
|---|---|---|---|
| *Awning, doz* | *$0.55* | *.85* | *1.15* |

*Hay Fork, Swivel or Solid Eye..... doz., 4 in., $1.15; 5 in., $1.40*

| *Inch* | *2* | *2¼* | *2½* |
|---|---|---|---|
| *Hot House, doz* | *$0.70* | *.90* | *1.25* |
| *Inch* | *1¼* | *1½* | *1¾* | *2* |
| *Screw.....doz* | *$0.16* | *.19* | *.23* | *.30* |
| *Inch* | *1¼* | *2* | *2¼* | *2½* |
| *Sid.....doz* | *$0 30* | *.40* | *.55* | *.63* |
| *Inch.....* | *1½* | *1¾* | *2* | *2¼* |
| *Trable....doz* | *$0.30* | *.42* | *.53* | *1.00* |

Stowell's:
Calling or End, Anti-Friction.....60%
Dumb Waiter, Anti-Friction..60&10%
Hay Fork, Anti-Friction, 5-in. Wheel, ₱ doz. $12.00.....50%
Electric Light.....60%
Side, Anti-Friction.....0&10%

## Sash Pulleys—

*Common Frame; Square or Round End, per doz., 1¾ and 2 in., 16@19c*
*Auger Mortise, no Face Pla e, per doz. 1¾ and 2 in.....16@19c*
*Auger Mortise, with Face Plate, per doz., 1¾ and 2 in.....16@19c*
Acme.....1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2 in. ₱ doz 25¢
Grand Rapids All Steel Noiseless....50%
Ideal No. 13.....1¾ in., ₱ doz., 16¢
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy....1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

## Pumps—

*Cistern.....60@60&10%*
*Pitcher Spout.....75¢10@80%*
*Wood.....50@50&10%*
*Pump Leathers, Lower and Plunger Valves—Per gro.:*

| *Inch..* | *2* | *2¼* | *2½* | *2¾* |
|---|---|---|---|---|
| | *$2.20* | *2.50* | *2.75* | *3.00* |
| *Inch..* | *3* | *3¼* | *3½* | *3¾* | *4* |
| | *$3.30* | *3.60* | *3.85* | *4.10* | *4.40* |

Barnes Dbl. Acting (low list).....50%
Contractors' Rubber Diaphragm No. 2 B. & L. Block Co.....$16.00
Flint & Walling's Fast Mail (low list).55%
Flint & Wall..g's Pitcher Spout.....75%
Loud's Suction Pumps, U. S. Co.....20%
Myer's Pumps, low list.....50%
Myers' Power Pumps.....50%
Daisy Spray Pump.....₱ doz. $7.50
Myers' Spray Pumps.....50&10%

## Punches—

*Saddlers' or Drive, good..doz. 65@70c*
*Spring, single tube, good quality... $1.75@2.00*
*Revolving (4 tubes)...doz. $3.75@4.00*
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Morrill's No. 1 (A. B. C.), ₱ doz, $15.00..50%
No. 2, ₱ doz. $22.50.....50%
No. 2, Metal, ₱ doz., $45.00.....50%
Bench Punch, each, $40.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....60%

## Rail— Barn Door, &c.—

*Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:*

| ½ | ⅝ | ¾ in. | |
|---|---|---|---|
| *$1.70* | *$2.10* | *$3 00* | *100 feet.* |

*Angular for Sq. Groove Wheels:*

| *Small* | *Med.* | *Large.* | |
|---|---|---|---|
| *$1.00* | *1 95* | *2.70* | *100 feet.* |

*Sliding Door, Brnzed Wr'It Iron, ft. 6½c*
*Sliding Door, Iron Painted....3½@3c*
*Sliding Door, Wrought Brass, 1¼ in.....lb. 36c...30%*
Allith Mfg. Co. Reliable Hanger Track ₱ foot.....10¢
Cronk's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3½¢
Lanes' O. N. T., ₱ 100 ft., 1 inch, $3.10; 1¼ inch, $4.90; 1½ inch, $4.85.
Lanes' Standard, ₱ 100 ft.....3.75
Lawrence Bros.' ₱ ft. 4½¢
Lawrence Bros. New York.....3½¢
McKinney's Hinged Hanger Rail ₱ foot, 11¢.....50%
McKinney's None Better.....₱ ft. 3½¢
McKinney's Standard.....₱ ft. 4 ¢
Myers' Stayon Track.....50&10%
Smith's Wrought Bracket, Plain.....3½¢
Smith's Special.....4½¢
Smith's Never Jump, per ft. 11¢.....50%
Smith's Plain Steel.....30%
Smith's Milled Steel.....4½¢
Stowell's Cast Rail.....1½¢
Stowell's Steel Rail, Plain.....25%
Stowell's Wrought Bracket, Plain....3½¢
Swett's Hylo, per ft. 11¢.....50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $3.00

## Rakes—

*Net Prices, Malleable Rakes:*

| | *10* | *12* | *14* | *16-tooth* |
|---|---|---|---|---|
| *Shank* | *$1.50* | *1.60* | *1.75* | *1.85* |
| *Socket* | *$1.65* | *1.80* | *1.95* | *2.10* |

*Steel, August 1, 1899, List...70@5&20%*
*Malleable.....70@10@75@5%*
*Lawn Rakes, Metal Head, per doz, 20 teeth.....$3.25@3.50*
*24 teeth.....$3.60@3.75*
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 29 and 30 teeth, ₱ doz $4.00
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3 45
Lawn Queen, 24-tooth, ₱ doz.....$3.60
Paragon, 20 tooth, ₱ doz.....$2.75
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.....$2.98
Malleable Garden, 14-tooth, ₱ doz..$2.00

## Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5@70&10&5%
McCaffrey's American Standard.....60&10&5%
New Nicholson.....70&10%
see also *Files.*

## Razors—

Borsatic.....60 & 10%
Fox Razors, No. 42, ₱ doz. $20.00 } 25
Fox Razors, No. 44, ₱ doz. $20.00 } 25
Fox Razors, No. 82, Platina, ₱ doz. } 25.00
Red Devil.....60%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%
Safety Razors.....40%

## Safety Razors—

New Gem, in Tin Boxes.....₱ doz. $12.00
New Gem, Extra Blades.....₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.)..... ₱ doz. $5.60
Complete Razor, extra Blade in Leather Case.....₱ doz. $27.00

## Reels— Fishing—

Bishop's Independent Fish Reel Spooler, ₱ doz.....$30.00
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼ 4008, Silver Rubber Populo, Nickeled Populo, Aluminum, German Silver, Bronze, 3 04 N, 6 N, 4 N to 8 PN.....33⅓%
6 RW, 102 P and RN, 202 P and PN.40%
G 9.....20%
24 N to 28 PN.....35&10&10%
124 N, 974 PN, 002904 PN, 1020 R and PRN, 202 PR and PRN....50&5%
2904 N.....40&10&5%
5009 PN and N.....50%
2904 P.....50&10&5%
2904 PN.....60%
0924 N.....40&10%
02084 N.....45&12½&5%
Single Action Trout.....40&10%
986 P N, 802 and 802 N.....50&10%
Competitor, 304 and 304 PN.....35%
02304 P and PN.....40&5%
Safety and Salmon.....30%

## Registers—*List July 1, 1903.*

*Black Jap } 70@75 & 10&5*
*White Jap }*
*Bronzed }*
*Nickel Plated }*
*Electro Plated }*

## Registers, Cash—

Sun, No. 10, Metal Cabinet.....$30.00
Sun, No. 10, Wood Cabinet.....$25.00

## Revolvers—

*Single Action.....85@90c*
*Double Act'n, except 44 cal. $1.50@1.60*
*Double Action, 44 caliber...$1.75@1.95*
*Automatic.....$2.25@3.50*
*Hammerless.....$3.75@4.10*

## Riddles, Hardware Grade

*16 in., per doz.....$2.25@2.50*
*17 in., per doz.....$2.50@2.75*
*18 in., per doz.....$2.75@3 00*

## Rings and Ringers—

### Bull Rings—

| | ₱ | ½¼ | *3 Inch.* |
|---|---|---|---|
| *Steel* | *$0 70* | *0.75* | *0.80 doz.* |
| *Copper* | *1.00* | *1.10* | *1.35 doz.* |

### Hog Rings and Ringers—

*Hill's Rings....gro. boxes, $4.25@4.50*
*Hill's Ringers, Gray Iron, doz. 55@60c*
*Hill's Ringers, Mal. Iron, doz. 75@80c*
*Blair's Rings.....per gro. $5.00@5.25*
*Blair's Ringers...per doz. $0.60@ .65*
*Brown's Rings....per gro. $5.50@5.75*
*Brown's Ringers..per doz. $0.75@ .85*

## Rivets and Burrs—

*Copper.....50¢10@50¢10¢10%*
*Iron or Steel:*
*Tinners'.....75@75¢10%*
*Miscellaneous.....75@75¢10%*

## Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....66⅔%
Cronk's Brinkerhoff.....66⅔%
Lane's Stay.....33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $1.25

## Rope—

*Manila, 7-16 in. diam. and larger, tarred or untarred.....lb. 11½@11¾c*
*Manila, Hay, Hide and Bale Ropes, Medium and Coarse..... lb. 11½@12 c*
*Sisal, 7-16 in. diam. and larger:*
*Mixed.....lb. 8¼@ 8¼c*
*Pure.....lb. 9¼@ 9¼c*
*Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:*
*Mixed.....lb. 8¼@ 8¼c*
*Pure.....lb. 9¼@ 9¼c*
*Sisal, Tarred, Medium Lay Yarn:*
*Mixed.....lb. 7¾@ 8 c*
*Pure.....lb. 8¼@ 8¼c*
*Cotton Rope:*
*Best.....¼-in. and larger, lb. 16 c*
*Medium..¼-in. and larger, lb. 14 c*
*Com....¼-in. and larger, lb. 10 c*
*Jute Rope:*
*Thread No. 1, ¼-in. and up, lb. 6½c*
*Thread No. 2, ¼-in. and up, lb. 6 c*
*Yarn, ¼-in. and up.... lb. 5½c*
Old Colony Manila Transmission Rope, ₱ lb 17½¢

## Wire Rope—

*Galvanized.....40¢5%*
*Plain.....45¢5%*

## Ropes, Hammocks—

Covert Mfg. Co.:
Jute.....40&5%
Sisal.....30%
Covert Saddlery Works.....60&5%

## Rules—

*Boxwood.....60&10@60¢10¢5%*
*Ivory.....35¢10@35¢10¢5%*
Chapin-Stephens Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Miscellaneous.....50@50&10&10%
Combination.....55@55&10%
Stationers'.....10@10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60&10%
Stanley R. & L. Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Upson Nut Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%

## Sash Locks—See *Locks, Sash*

## Sash Weights—

See *Weights, Sash.*

## Sausage Stuffers or Fillers

—See *Stuffers or Fillers, Sausage*

## Saw Frames—See *Frames, Saw*

## Saw Sets—See *Sets, Saw.*

## Saw Tools—See *Tools, Saw.*

## Saws—

Atkins:
Circular.....50%
Band.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames...30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&5%
Disston's:
Circular, Solid and Inserted Tooth..50%
Band, 3 to 14 in wide.....60%
Band, ¼ to 2¾.....70%
Crosscuts.....45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, 108, 120, 75, 77, 8.....25%
Hand Saws, Nos 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Key hole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s.:
Back Saws.....25&10%
Butcher Saws.....30 &10%
Compass and Key Hole Saws.35&5&10%
Framed Wood Saws.....30&10%
Hand Saws.....20&2½&10%
Wood Saw Blades.....30&10%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace:
Circular and Mill.....50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richardson:
Circular and Mill.....50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....45%
Compass, Keyhole, &c.....2½@25&7½%
Wood Saws.....35@35&7½%

## Hack Saws—

Atkins' Hack Saw Blades A A A.....25%
Disston:
Concave Blades.....25%
Keystone.....40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best.....25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.....35&5&10%
Hack Saws, Nos. 175, 180, complete. 35&5&10%
Griffin's Hack Saw Frames...35&5&10%
Griffin's Hack Saw Blades.....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades.....25%
Sterling Hack Saw Frames.....30& 0&5%

## Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

## Scalers, Fish—

Bishop's Lightning.....₱ doz. $3 00
Covert's Saddlery Works.....60&10%

## Scales—

*Family, Turnbull's.....30@30&10%*
*Counter:*
*Hatch, Platform, ½ oz to 4 lbs. doz $5.50*
*Two Platforms, ½ oz to 8 lbs, doz. $16*
*Union Platform, Plain..$1.70@1.90*
*Union Platform, Striped $1 85@2.15*
Chamillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Chicago Scale Co.:
The "Little Detective," 25 lbs.....50%
Union or Family No. 2.....60%
Portable Platform (reduced list).....50%
Wagon or Stock (reduced list)..25@35%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing.....50%
"The Standard" Portables.....45%
"The Standard" R. R. and Wagon.....50%

## Scrapers—

*Box, 1 Handle.....doz. $2.25@2.50*
*Box, 2 Handle.....doz. $3.00@3 50*
*Ship Light, $2.50; Heavy, $4.00*
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30&30&10%
Chapin-Stephens Co., Box.....50@50&10%

## Screens, Window, and Frames—

Flyer Pattern Window Screen...60@60&5%
Maine Window Screen Frames...40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames.....60&5%
Porter's:
Fairview Window Screens..... 60&5@60&5&2½%
Hummer Window Screens..... 60&5@60&5&2½%
Klondike Window Screens..... 60&5@60&5&2½%

See also *Doors.*

### Screws—Bench and Hand—

*Bench, Iron..doz. 1 in..$2.75@3.00 :*
*1⅛, $3 25@3.50 : 1¼, $3.85@4.25*
*Bench, Wood, Beech..doz. $3.00@...50*
*Hand, Wood.....30@30&5%*
R. Bliss Mfg. Co, Hand.....30%
Chapin-Stephens Co., Hand.....30@30&10%

### Coach, Lag and Hand Rail—

*Lag, Common Point, list Oct. 1, '99.....70¢15@...%*
*Coach and Lag, Gimlet Point, list Oct. 1, '99.....70¢10@...%*
*Hand Rail, list Jan. 1, '81.60¢10@...%*

### Jack Screws—

*Standard List.....75¢10@80¢5%*
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P, S. & W.....30@50&10%
Sargent.....70&10%

### Machine—

*List Jan. 1, '98,*
*Flat or Round Head, Iron.50@50¢10%*
*Flat or Round Head, Brass50@50¢10%*

### Set and Cap—

*Set (Iron or Steel) .....70%*
*Sq. Hd. Cap.....65%*
*Hex. Hd. Cap .....65%*
*Rd. or Fillister Hd. Cap .....60%*

### Wood—

*List July 23, 1903.*
*Manufacturers' printed discounts :*
*Flat Head, Iron.....87½¢10@...%*
*Round Head, Iron.....85¢10@...%*
*Flat Head, Brass.....85&10@...%*
*Round Head, Brass .....80¢10@...%*
*Flat Head, Bronze....77½¢10@...%*
*Round Head, Bronze.....75¢10@...%*
*Drive Screws.....87½¢10%*

### Scroll Saws—See *Saws, Scroll.*

### Scythes—

*Per doz.*
*Clipper Pattern, Grass...$4.50@$5.00*
*Full Polished Clipper.....$5.0 @$5.50*
*Grain.....$7.00@$7.50*
*Clipper, Grain.....$7.75@$8.25*
*Weed and Bush.....$4.75@$5.00*

### Seeders—

Raisin—
Enterprise.....25@30%

### Sets—

Awl and Tool—
*Brad Awl and Tool Sets :*
*Wood Hdle., 10 Awls doz. $2.00@2.25*
*Wood Hdle., 14 Awls, 6 Tools .. doz. $2.50@2.60*
Aiken's Sets, Awl and Tools :
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H'dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders.....30&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior :
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30@30&10&10%

### Garden Tool Sets—

Ft. Madison, Three Pieces, Hoe, Rake and Shovel.....₱ doz. sets.....$9.00

### Nail—

*Square.....per gro. $2.25@2.50*
*Round, Blk. and Pol., assorted..... gro. $1.80@2.50*
*Octagon.....gro. $4.00@4.25*
*Knurled, Good.....gro. $5.75@6.00*
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $3.00
Snell's Corrugated, Cup Pt. per gro, $7.50
Snell's Knurled, Cup Pt....per gro $7.50

### Rivet—

*Regular list.....70¢10@75%*

### Saw—

Aiken's:
Genuine.....50&10%
Imitation.....50&10%
Atkin's:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.63.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 95, $15.63.....30%
No. 1 Old Style, $10.00.....50%
Giant Royal, Cross Cut .....₱ doz. $9.00
Royal Hand.....₱ doz. $5.40
Taintor Positive, ₱ doz. $18 .....60%

### Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%
Smith & Hemenway Co.....70%

### Shaves Spoke—

*Iron.....doz. $1 00@1 15*
*Wood.....doz. $1.65@2.25*
Bailey's (Stanley R. & L. Co.).....50@50&10&10%
Chapin-Stephens Co .....50@50&10&10%
Goodell's, ₱ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

### Shears—

| | 7 | 8 | 9 in. |
|---|---|---|---|
| *Cast Iron...* | | | |
| *Best* | *$16.00* | *18.00* | *20.00 gro.* |
| *Good* | *$13.00* | *15.00* | *17 00 gro.* |
| *Cheap* | *$5.00* | *6.00* | *7.00 gro.* |

*Straight Trimmers, &c.:*
*Best quality, Jap.....70@70¢10%*
*" Nickel.....60@60¢10%*
*Fair qual. Jap.....80@80¢5%*
*" Nickel.....75@75¢10%*
*Tailors' Shears.....40@40¢10%*
Acme Cast Shears.....40@40&5%
Geneva.....60%
Heinisch's Tailors' Shears.....40%
Wilkinson's Hedge .....1900 list 45%
Wilkinson's Pruning.....40%
Wilkinson's Sheep .....1900 list, 25%

### Tinners' Snips—

*Steel Blades .....20¢5@20¢10*
*Steel Laid Blades .....40¢10@50%*
Forged Handles, Steel Blades, Berlin .....40@40&10%
Jennings & Griffin Mfg. Co.'s, 6¼ to 10 inch .....40&7½&10%
Niagara Snips .....40%
P., S & W. Co. .....20%

### Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00 .....25%
Disston's Pruning Hook, ₱ doz. $12.00 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades.....40@40&5%
Orange Shears.....50&10@50&20%
Grape .....40&10@50%
Tree Pruners.....75%
P., S. & W. Co.....33⅓%

### Sheaves—Sliding Door—

Stowell's Anti-Friction .....50%
Patent Roller Hatfield's, Sargent's list, 70&10%
Reading.....70&10@75%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....80%

### Sliding Shutter—

Reading list.....70&10@75%
R. & E. list.....33⅓%
Sargent's list.....50&10%

### Shells—

Shells, Empty—
Brass Shells, Empty :
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.. 65&5%
Paper Shells, Empty :
Acme, Ideal, Leader, New Rapid, Magic 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, New Victor, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge.....20%
Climax, Union, League, New Rival 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....20&10%
Robin Hood, High Brass.....30&10%

### Shells, Loaded—

*Loaded with Black Powder .....40%*
*Loaded with Smokeless Powder, medium grade.....40¢5%*
*Loaded with Smokeless Powder, high grade. .....40¢10¢10%*
Robin Hood, Low Brass. .....50%
Robin Hood, High Brass.....50&10&5%

### Shoes Horse, Mule, &c.—

*F. o. b., Pittsburg:*
*Iron.....per keg $3.85*
*Steel.....per keg 3.60*
Burden's, all sizes, ₱ keg..... ..$3.90

### Shot—

*Drop, up to B, 25-lb. bag.....$1.50*
*Drop, B and larger, per 25-lb. bag$1.75*
*Buck, 25-lb. bag.....$1.75*
*Chilled, 25-lb. bag.....$1.75*
*Dust Shot, 25-lb. bag.....$2.00*

### Shovels and Spades—

*Association List, Nov. 15, 1902....40%*

### Sieves and Sifters—

*Hunter's Imitation.gro. $11.00@11.50*
Buffalo Metallic Blued, S. S. & Co., ₱ gr.:

| 14&16 | 16&18 | 18&20 |
|---|---|---|
| $12.90 | $13.80 | $15.00 |

National Mfg. Co.:
Victor.....per gro. $12.00
Surprise.....per gro. $11.00
No Name.....per gro. $11 00
Shaker (Barler's Pat.) Flour Sifters, ₱ doz., $2.00.....30%

### Sieves, Tin Rim—

*Per dozen*

| *Mesh* | *14* | *16* | *18* | *20* |
|---|---|---|---|---|
| *Black, full size* | *$1.20* | *1.25* | *1.30* | *1.35* |
| *Plated, full size* | *$1.30* | *1.35* | *1.40* | *1.45* |
| *Black, scant* | *....* | *$0.95* | *1.00* | *1.05* |

### Sieves, Wooden Rim—

*Nested, 10, 11 and 12 Inch.*
*Mesh 18, Nested, doz.....$0.65@0.75*
*Mesh 20, Nested, doz..... .75@ .85*
*Mesh 24, Nested, doz ..... .90@1.00*

### Sinks—

Cast Iron—
*Standard list.....60@60¢10%*
NOTE.—*There is not entire uniformity lists used by jobbers.*

### Skeins, Wagon—

*Cast Iron.....70@70¢10%*
*Malleable Iron.....40¢10@50%*
*Steel.....40@40¢10%*

### Slates, School—

*Factory Shipments.*
*"D" Slates.....45%*
*Noiseless Slates.....60¢¼ tens &5%*
*Wire Bound.....40%*

### Slaw Cutters—See *Cutters.*

### Slicers, Vegetable—

Sterling No, 10, $2.00.....33⅓

### Snaps, Harness—

*German.....40@40¢10%*
Covert Mfg. Co.:
Derby.....30&5&2%
High Grade.....45%
Jockey.....30&10%
Trojan.....45%
Yankee.....30&5&2%
Yankee, Roller.....30&5&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
Oneida Community :
Solid Steel.....60&5%
Solid Swivel.....60%
Sargent's Patent Guarded .....66⅔&10%

### Snaths—

*Scythe.....45&5@50&12½%*

### Snips, Tinners'—See *Shears.*

### Spoons and Forks—

Silver Plated—
*Good Quality.....50¢10@60¢10¢5%*
*Cheap.....60@60¢10%*
International Silver Co.
1847 Rogers Bros. and Rogers & Hamilton.....40¢10%
Rogers & Bro., William Rogers Eagle Brand.....50¢10%
Anchor, Rogers Brand..60%
Wm. Rogers & Son.....60¢10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....60¢10%

### Miscellaneous—

*German Silver.....60@60¢10%*
Cattaraugus Cutlery Co.:
Yukon Silver.....50%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list L.&10%

### Tinned Iron—

*Teas.....per gro. 45@50c*
*Tables.....per gro. 90c@$1.00*

### Springs—

Door—
Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in.....₱ doz. $1.10
Victor (Coil).....50&10&10%

### Carriage, Wagon, &c.

*1¼ in. and Wider :*
*Black or ¼ Bright, lb.....4¾@5 c*
*Bright, lb.....5¼@5½c*
*Painted Seat Springs :*
*1½ x 2 x 26 per pr.....50@55c*
*1½ x 2 x 28 per pr. .....60@65c*
*1½ x 3 x 28 and narrower, per pr. 80@85c*

### Sprinklers, Lawn—

Enterprise.....25@30%
Macksey.....₱ doz. $1.80
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

### Squares—

*Nickel plated....* } *List Jan. 5, 1900.*
*Steel and Iron...* } *70¢10@70¢10¢10%*
*Rosewood Hdl Try Square and T-Bevels .....60¢10¢10@70%*
*Iron Hdl. Try Squares and T-Bevels. 40¢10@40¢10¢10%*
Disston's Try Sq. and T-Bevels.....70%
Winterbottom's Try and Miter..... 40&10@40&10&10%
NOTE.—*Discount of 50c per dozen on three-dozen lots. Discount of $1 per dozen on five-dozen lots.*

### Squeezers—

Lemon—
*Wood, Common, gro., No. 0, $5.25 @$5.50 : No. 1. $6.25@$6.50.*
*Wood, Porcelain Lined.*
*Cheap .....doz. $2.00@2.75*
*Good Grade.....doz. $3.00@3.50*
*Tinned Iron.....doz. $0.75@1.25*
*Iron, Porcelain Lined.doz. $2.90@3.25*

### Staples—

*Barbed Blind. .....lb. 6@6½c*
*Electricians', Association list..... 80¢10&10&10%*
*Fence Staples, See Trade Report, Galvanized, 15c less than Barb Wire Polished. 20c less than Barb Wire.*
*Poultry Netting, Staples....per lb.. 3¼@3½c*
Grand Crossing Tack Co.'s list....80&10%

### Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
Hartzell Cutlery Co.....30&5%
C. & A. Hoffmann's.....40%

### Steelyards.....25¢10@30¢10%

### Stocks and Dies—

*Blacksmiths' .....40¢10@50%*
Curtis Reversible Ratchet Die Stock.25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%

### Stone—

Scythe Stones—
Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $8.00 per gro., 12 inch, $10.80
Pike Mfg. Co. 1901 list:
Black Diamond S. S....₱ gro. $12.00
Lamoille S. S .....₱ gro. $11.00
White Mountain S. S....₱ gro. $9.00
Green Mountain S. S....₱ gro. $6.00
Extra Indian Pond S. S. ₱ gro. $7.50
No. 1 Indian Pond S. S...₱ gro. $7.00
No. 2 Indian Pond S. S...₱ gro. $4.50
Leader Red End S. S.....₱ gro $4.50
Balance of 1901 list 33⅓%

### Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....55%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list: ₱ lb.
Arkansas Stone, No. 1, 3 to 5½ in. $2.80
Arkansas Stone, No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1.....$4.00
Lily White Washita 4 to 8 i.....60¢
Rosy Red Washita, 4 to 8 in.....60¢
Washita Stone, Extra, 4 to 8 in..50¢
Washita Stone, No. 1, 4 to 8 in..40¢
Washita Stone, No. 2, 4 to 8 in..30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
India Oil Stones (entire list) .....33⅓%

### Stoners—

Cherry—
Enterprise.....25@30%

### Stops, Bench—

Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

### Door—

Chapin-Stephens Co.....60@60&10%

### Plane—

Chapin-Stephens Co.....3%

### Straps—

Box—
Cary's Universal, case lots.....20&10%

### Hame—

Covert's Saddlery Works.....60&10%

### Stretchers, Carpet—

*Cast Iron, Steel Points....doz. 55@60c*
*Socket.....doz. $1.75*
Excelsior Stretcher and Tack Hammer Combined, per doz. $6.....30%

### Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

### Supports, Porch—

Hoffman's Porch Supports....₱ doz. 25¢

### Sweepers, Carpet—

National Sweeper Co.: Per doz
Marion, Roller Bearing, regular finishes, full Nickel.....$24.00
Marion Queen, Roller Bearing, Fancy Veneers, full Nickel.....$27.00
Monarch, Roller Bearing, Nickel..$22.00
Monarch, Roller Bearing, Jap'ned.$21.00
Marion Queen, Roller Bearing, Regular Finishes, full Nickel.....$24.00
Transparent, Roller Bearing, Plate Glass Top, Nickel.....$32.00
Monarch Extra, Roller Bearing, (17-inch case), Nickel.....$36.00
Monarch Extra, Roller Bearing (17-inch case), Japanned.....$33.00
Perpetual, Regular Bearings, Nickel.$30.00
Perpetual, Regular Bearings, Jap.$14.00
NOTE.—*Discount of 50c per dozen on three-dozen lots. Discount of $1 per dozen on five-dozen lots.*

### Tacks, Brads, &c.—

*List Jan. 15, '99.*
*Carpet Tacks, American ..... 90¢25¢5@....%*
*American Cut Tacks.90¢20¢5@....%*
*Swedes Iron Tacks ...90¢30¢5@....%*
*Swedes Upholsterers' Tacks..... 90¢45&10¢5@....%*
*Gimp Tacks.....90¢45¢5@....%*
*Lace Tacks.....90¢10@....%*
*Trimmers' Tacks..90¢30¢10¢5@....%*
*Looking Glass Tacks....70¢10@....%*
*Bill Posters' and Railroad Tack.... 90¢45¢5@....%*
*Hungarian Nails ....80¢20¢5@....%*
*Common and Patent Brads.....80¢10%*
*Trunk and Clout Nails..80¢5@....%*
NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10¢5% on Standard Weights.****

### Miscellaneous—

*Double Pointed Tacks...90 and 5 tens*
Steel Wire Brads, R. & E. Mfg. Co 's list.. 50&10@60%

See also *Nails, Wire.*

### Tanks, Oil—

| | Each. |
|---|---|
| Emerald, S. S. & Co.....30-gal | $3.40 |
| Emerald, S. S. & Co.....60-gal. | $4.25 |
| Queen City S. S. & Co., 30-gal..... | $3.65 |
| Queen City S. S. & Co., 60-gal..... | $4.50 |

### Tapes, Measuring—

*American Asses' Skin.....40¢10@50%*
*Patent Leather.....25@50¢5%*
*Steel.....40@40¢5%*
*Chesterman's.....25@25¢5%*
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899..... 35%
Lufkin's Steel.....33⅓&35%
Lufkin's Metallic.....30@30&5%

### Teeth, Harrow—

*Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lbs. ..$3.00*

### Thermometers—

*Tin Case.....80¢10@80¢10¢5%*

### Ties, Bale—Steel Wire.

*Single Loop.....80¢2½*
*Monitor, Cross Head, Etc.....70%*

### Ties, Wall—

Cleveland Wire Spring Co. :
Galv. Steel 5-32 x 6½ in. ₱ 1000..$10.00
Galv. Steel 5-32 x 8½ in. ₱ 1000..$11.00
Galv. Steel 5-32 x 11½ in. ₱ 1000..$12.00
Galv. Steel 5-32 x 15½ in. ₱ 1000..$14.00

### Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

### Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

### Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

### Tire Benders, Upsetters, &c.—

See *Benders and Upsetters, Tire.*

### Tools— Coopers'—
L. & I. J. White ..... 20@20&5%

### Hay—
Myers' Hay Tools ..... 50%

### Saw—
Atkins' Cross Cut Saw Tools ..... 40%
Simonds' Improved ..... 33⅓&5%
Simonds' Crescent ..... 25%

### Ship—
L. & I. J. White ..... 25%

### Transom Lifters—
See *Lifters, Transom.*

### Traps— Fly—
*Balloon, Globe or Acme ..... doz. $1.15@1.35 ; gro. $11.50@13.00*
*Harper, Champion or Paragon ..... doz. $1.25@1.40 : gro. $13.00@13.50*

### Game—
*Oneida Pattern ..... 80@30&5%*
Newhouse ..... 45@45&5%
Hawley & Norton. ..... 65&5@65&10%
Victor (Oneida Pattern) ..... 75@75&5%
Star (Blake Pattern) ..... 60&5@60&10%

### Mouse and Rat—
*Mouse, Wood, Choker, doz. holes ..... 8½@9c*
*Mouse, Round or Square Wire ..... doz. 85@90c*

Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 7 $2.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25

Schuyler's Rat Killer, No. 1, ₱ gr. $30.00
No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00 ..... 50%

J. M. Mast Mfg. Co.: Per gro.

| | Mouse. | Rat. |
|---|---|---|
| Blizzard ..... | No. 12, $3.00 | No. 1, $9 30 |
| Old Nick ..... | No. 30, 2.22 | No. 2, 8.40 |
| Joker ..... | No. 5, 2.10 | No. 3, 8.40 |

Imp'd Snap Shot, Mouse, per gro., 2 hole, $2 40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4.20.

### Trimmers Spoke—
Bonney's Nos. 1 and 2 ..... 33⅓&5%
Wood's E 1 ..... 50%

### Trowels—
Diston Brick and Pointing ..... 30%
Diston Plastering ..... 25%
Diston "Standard Brand" and Garden Trowels ..... 35%
Kohler's Steel Garden Trowels, 5 in. ..... ₱ gro. $5.00
Kohler's Steel Garden Trowels, 6 in. ..... ₱ gro. $6.00
Never-Break Steel Garden Trowels ..... gro. $6.00
Peace's Plastering ..... 30%
Rose Brick and Plastering ..... 25&5%
Woodrough&McParlin, Pl'st'ring ..... 25%

### Trucks, Warehouse, &c.—
R. & L. Block Co.:
New York Pattern ..... 50&10%
Western Pattern ..... 60&10%
Handy Trucks ..... per doz. $16.00
Grocery ..... per doz. $15.00
Daisy Stove Trucks, Improved pattern ₱ doz. $18.50
Model Stove Trucks ..... ₱ doz. $18.50

### Tubs, Wash—

| | No. 1 | 2 | 3 |
|---|---|---|---|
| Galvanized, per doz. | $4.75 | 5.25 | 6.00 |

Galvanized Wash Tubs (S. S. & Co.):

| No. | 1 | 2 | 3 | 10 | 20 | 30 |
|---|---|---|---|---|---|---|
| Per doz. | $5 25 | 6.00 | 6.75 | 6.50 | 7.00 | 8.00 |

### Twine—Miscellaneous—
*Flax Twine— BC B.*
*No. 9, ¼ and ½-lb. Balls 21½c 23½c*
*No. 12, ¼ and ½ lb. balls 17½c 19½c*
*No. 18, ¼ and ½-lb. Balls 15½c 17½c*
*No. 24, ¼ and ½-lb. Balls 15 c 17 c*
*No. 36, ¼ and ½-lb. Balls 14½c 16½c*
*Chalk Line, Cotton, ½-lb Balls .... 23@50c*
*Cotton Mops, 6, 9, 12 and 15 lb. to doz ..... 9@10c*
*Cotton Wrapping 5 Balls to lb .... according to quality .. 12¼c@23c*
*American 2-Ply Hemp, ¼ and ½-lb. Balls ..... 13@14c*
*American 3 Ply Hemp, 1-lb. Balls .. 13@14c*
*India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) ..... 8c*
*India 3-Ply Hemp, 1-lb. Balls ..... 8c*
*India 3-Ply Hemp, 1½-lb. Balls .. .7c*
*2, 3, 4 and 5-Ply Jute, ½-lb. Balls ... 8@10c*
*Mason Line, Linen, ½-lb. Balls .. .45c*
*No. 25½ Mattress, ¼ and ½-lb. Balls .57c*
*Wool, 3 to 6 ply ..... 5½@6c*

## Vises—
*Solid Box ..... 50&10@50&10&5*

### Parallel—
Athol Machine Co :
Simpson's Adjustable ..... 40%
Standard ..... 40%
Amateur ..... 25%
Bonney's ..... 33⅓%
Columbian Hdw. Co ..... 40%
Emmert Universal :
Pattern Makers' No. 1 ..... $15.00
Pattern Makers' No 2 ..... $12.50
Machinist and Tool Makers' No. 4 $12.50
Fisher & Norris Double Screw .... 15&10%
Hollands':
Machinists' ..... 40%
Key-stone ..... 65&5%
Lewis Tool Co. ..... 30@30%
Merrill's ..... 20%
Miller's Falls ..... 50&10&10%
Parker's:
Victor ..... 20@25%
Regulars ..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe ..... 55@60%
Prentiss ..... 20@25%
Sargent's ..... 40%
Smith & Hemenway Co.:
Machinists ..... 40%
Jewelers ..... 33⅓%
Snediker's X. L. ..... 33⅓%
Stephens' ..... 33⅓%

### Saw Filers'—
Bonney's, No. 1, $13; No. 3, $16 .... 40%
Disston's D 3 Clamp and Guide, ₱ doz $30 ..... 25%
Reading ..... 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 ..... 45&50%

### Wood Workers'—
Wyman & Gordon's Quick Action, 3 in., $6.00 ; 9 in., $7.00 ; 14 in., $8.00.

### Miscellaneous—
Bignall & Keeler Combination Pipe Vise ..... 60%
Parker's Combination Pipe: 87 Series ..... 60%
187 Series ..... 60&5%
No. 870 ..... 40%

## Wads—Price Per M.

| | |
|---|---|
| *B. E., 11 up* | .60c |
| *B. E., 9 and 10* | .70c |
| *B. E., 8* | .80c |
| *B. E., 7* | .80c |
| *P. E., 11 up* | $1.00 |
| *P. E., 9 and 10* | 1.25 |
| *P. E., 8* | 1.50 |
| *P. E., 7* | 1.50 |
| *Ely's B. E., 11 and larger* | $1.70@1.75 |
| *Ely's P. E., 12 to 20* | $3.00@3.25 |

Dis. 15%

### Ware, Hollow—
### Cast Iron, Hollow—
*Stove Hollow Ware :*
*Ground ..... 50&10@60%*
*Unground ..... 60&5@65%*
*White Enameled Ware :*
*Maslin Kettles ..... 70%*
*Covered Ware :*
*Tinned and Turned ..... 40%*
*Enameled ..... 50%*
See also *Pots Glue.*

### Enameled—
Agate Nickel Steel Ware, list Nov. 1, '01 ..... 50&20%
Iron Clad Ware ..... 70&10%
Lava, Enameled ..... 40&10%
Never Break Enameled ..... 50%

### Tea Kettles—
*Galvanized Tea Kettles :*

| | *No. 7* | *8* | *9* |
|---|---|---|---|
| *Inch* | 6 | | |
| *Each* | .45c | 50c | 55c |

### Steel Hollow Ware.
Avery Spiders & Griddles ..... 65@65&5%
Avery Kettles ..... 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles ..... 65&5%
Never Break Kettles ..... 60%
Solid Steel Spiders & Griddles. ..... 65&5%
Solid Steel Kettles ..... 60%

### Warmers, Foot—
Pike Mfg. Co., Soapstone ..... 40@40&10%

### Washboards—
Solid Zinc: ₱ doz
Crescent, family size, bent frame. $3.00
Red Star, family size, stationary protector ..... $3.00
Double Zinc Surface :
Saginaw Globe, family size, stationary protector ..... $2.65
Cable Cross, family size, stationary protector ..... $2.90
Single Zinc Surface :
Naiad, familysize, open back perforated ..... $2.40
Saginaw Globe, protector, family size, ventilated back ..... $2.95
Brass Surface:
Brass King, Single Surface, open back ..... $3.00
Nickel Plate Surface :
No. 1001 Nickel Plate, Single Surface $3.00

### Washers—
### Leather, Axle—
*Solid ..... 80@10@80@10&10%*
*Patent ..... 90@90@90@5%*
*Coil: ⅞ 1 1⅛ 1¼ Inch.*
*11c 12c 13c 14c per box*

### Iron or Steel
*Size bolt .... 5-16 ⅜ ½ ⅝ ¾*
*Washers .... $6.80 5.90 4.60 4.40 4.20*
*In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.*

### Cast Washers—
*Over ½ inch, barrel lots. per lb. ..... 1¼@2c*

### Waterers, Hog—
Improved Dewey. ₱ doz ..... $13.00

### Wedges—
*Oil Finish ..... lb. 2.90@3.10c*

### Weights—
### Hitching—
Covert's Saddlery Works ..... 60&10%

### Sash—
*Per ton, f.o.b. factory :*
*Eastern District ..... $26.00*
*Western, Central and Southern Districts ..... $27.00*

### Wheels, Well—
*8-in.. $1.60@1.80; 10-in., $2.00@2.25; 12-in., $2.45@2.65; 14-in., $4.00@4.25*

### Wire and Wire Goods—
*Bright and Annealed :*

| | |
|---|---|
| *6 to 9* | .72½&c5@72½&c10% |
| *10 to 18* | .72½&c10@72½&c10&5% |
| *19 to 26* | .75&c7½@75&c10&c2½% |
| *27 to 36* | .75&c10&c7½@80&c2½% |
| *Galvanized :* | |
| *6 to 18* | .70@70&c5% |
| *19 to 26* | .72½&c5@72½&c10% |
| *27 to 36* | .72½&c10@72½&c10&5% |
| *Coppered :* | |
| *6 to 9* | .70&c5@70&c10% |
| *10 to 18* | .70&c10@70&c10&5% |
| *19 to 26* | .75&c7½@75&c10&c2½% |
| *27 to 36* | .75&c10@75&c10&5% |
| *Tinned :* | |
| *6 to 14* | .75@75&c7½% |
| *15 to 18* | .72½&c7@73% |
| *19 to 26* | .70&c5@70&5&c5% |
| *27 to 36* | .70@70&c5% |
| *Annealed Wire on Spools* | .70@70&c5% |
| *Brass and Copper Wire on Spools* | .60@60&5% |
| *Brass, list Feb. 26, '96* | .30% |
| *Copper, list Feb. 26, '96* | .15% |
| *Cast Steel Wire* | .50% |
| *Stubs' Steel Wire* | .$6.00 to £. 40% |

Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

### Bright Wire Goods—
*List June 24, 1903 ..... 90@90&c10%*

### Wire Cloth and Netting—
*Galvanized Wire Netting . .80&c10%*
*Painted Screen Cloth per 100 ft. $1.15*
*Standard Hardware Grade :*
*Nos. 2, 2½ and 3 Mesh, sq. ft. .... 3c*
*Nos. 4 and 5 Mesh, sq. ft. .... 3½c*
*No. 6 Mesh, sq ft .... 3½c*
*No. 8 Mesh, sq ft .... 4c*

### Wire Barb—See *Trade Report.*

### Wrenches—
*Agricultural ..... 80@80&c10%*
*Baxter Pat'rn S Wrenches 70&c5@70&c10%*
*Drop Forged S ..... 45@45&c5%*
Acme ..... 60&10%
Alligator ..... 70%
Alligator Pattern ..... 70%
Bull Dog ..... 70%
Bemis & Call's:
Adjustable S ..... 35&5%
Adjustable S Pipe ..... 40%
Brigg's Pattern ..... 30&10%
Combination Black ..... 40&5%
Combination Bright ..... 40%
Merrick's Pattern ..... 50%
No. 3 Pipe, Bright ..... 55%
Boardman's ..... 33⅓%
Coes' Genuine Knife Hdl ..... 40&10&5&5%
Coes' Genuine Steel Hdl ..... 40&10&5&5%
Coes' Genuine Key Model ..... 40&10&5&5%
Coes' "Mechanics' ..... 40&10&10&5&5%
Donohue's Engineer ..... 40&10%
Dudly Auto ..... 50&5@50&10%
Eagle ..... 50&10%
Elgin Wrenches ..... 40%
Elgin Monkey Wrench Pipe Jaws ..... 33⅓%
Gem Pocket ..... 30%
Hercules ..... 70%
W. & B. Machinist:
Case lots ..... 50&10%
Less than case lots ..... 50&5%
Improved Pipe (W. & B.) ..... 60%
Solid Handles, P. S. & W ..... 50@50&5%
Stillson ..... 65%
Triumph ..... 60&10%
Vulcan Chain ..... 50%

### Fruit Jar—
Triumph Fruit Can Wrenches, ₱ gro. $19.20
Syrup Cap Wrenches ..... ₱ gro. $8.00
T & B Fruit Jar Wrenches. ₱ gro $16.50
T & B Fruit Jar Holders.. ₱ gro. $30.00

30%

### Wrought Goods—
*Staples, Hooks, &c., list March 17 '92 ..... 90@90&c5%*

### Yokes, Neck—
Covert Saddlery Works, Trimmed. ..... 70%
Covert Saddlery Works, Neck Yoke Centers ..... 70%

### Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters' .. list net.

### Zinc—
*Sheet ..... lb 7 @7¼c*

# PAINTS, OILS AND COLORS.

### White Lead, Zinc, &c.
Lead, English white, in Oil .... 7¼@ 9¾
Lead, American White, in Oil:
Lots of 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price ..... @ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price .. @ 1½
Lead, American, Terms: For lots 12 tons and over ¼c rebate ; and 2% for cash if paid in 15 days from date of invoice ; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net.
Lead White, Dry in bbls ..... 5¾@ 6¼
Lead, American, dry ..... ₱ ℔ 4¾@ 4¾
Lead, Paris, Red Seal, dry ..... @ 8¾
Lead, Paris, Green Seal, dry .... @ 9¾
Lead, Antwerp Red Seal, dry .... @ 6¾
Lead, Antwerp, green seal, dry .. @ 8½
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over ..... 12 @12¼
Lots of less than 1 ton ..... 12¼@12¾
Zinc, V. M. French, in Poppy Oil, Red Seal:
Lots of 1 ton and over ..... 10¾@11¼
Lots of less than 1 ton ..... 11@11¼
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or different grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

### Dry Colors.
Black, Carbon ..... ₱ ℔ 5 @10
Black, Drop, Amer ..... 4 @ 6
Black, Drop, Eng ..... 5 @15
Black, Ivory ..... 16 @20
Bone, Com ..... 4½@ 6
Bone, Celestial ..... ₱ ℔ 4 @ 6
Bone, Chinese ..... 29 @32
Bone, Prussian ..... 27 @30
Blue, Ultramarine ..... 4½@15
Brown, Spanish ..... ½@ 1
Carmine, No. 40 ..... ₱ ℔ $2.50@2.90
Green, Chrome, ordinary ..... 3½@ 6
Green, Chrome, pure ..... 17 @25
Lead, Red, bbls. ⅛ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7¼
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7¼
Ocher, French Washed ..... 5 @ 7
Ocher, Dutch Washed ..... 5 @ 7
Ocher, American ..... ₱ ton $4.50@13.00
Orange Mineral, English .. ₱ ℔ 8¾@ 9½
Orange Mineral, French ..... 10½@11¼
Orange Mineral, German ..... 9 @10½
Orange Mineral, American .... 8½@ 8¾
Red, Indian, English ..... 4½@ 8½
Red, Indian, American ..... 3 @ 3¼
Red, Turkey, English ..... 4 @ 6
Red, Tuscan, English ..... 7 @10
Red, Venetian, Amer., ₱ 100 ℔ .. 50@1.50
Red Venetian, English. ₱ 100 ℔ 1.25@1.75
Sienna, Italian, Burnt and Powdered ..... ₱ ℔ 3 @ 6½
Sienna, Ital., Raw, Powd ..... 3 @ 4½
Sienna, American, Raw ..... 1½@ 2
Sienna, American, Burnt and Powdered ..... ₱ ℔ 1½@ 2
Talc, French ..... ₱ ℔ 2 @ 2¾
Talc, American ..... 1.10@1.50
Terra Alba, French, ₱ 100 ℔ .. 95 @1.00
Terra Alba, English ..... 95 @1.00
Terra Alba, American No. 1 .... 65 @85
Terra Alba, American No. 2 .... 45 @50
Umber, Turkey, Bnt. & Pow. ₱ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer ..... 1½@ 2
Umber, Raw, Amer ..... 1½@ 2
Yellow, Chrome ..... 11 @14
Vermilion, American Lead .... 10 @40
Vermilion, Quicksilver, bulk .... @70
Vermilion, Quicksilver, bags .... @71
Vermilion, English, Import .. .80 @85
Vermilion, Chinese .... .$0.90@1.00

### Colors in Oil.
Black, Lampblack ..... 12 @14
Blue, Chinese ..... 36 @40
Blue, Prussia ..... 32 @36
Blue, Ultramarine ..... 13 @16
Brown, Vandyke ..... 11 @14
Green, Chrome ..... 10 @15
Green, Paris ..... @24
Sienna, Raw ..... 12 @15
Sienna, Burnt ..... 12 @15
Umber, Raw ..... 11 @14
Umber, Burnt ..... 11 @14

### Miscellaneous.
Barytes, Foreign, ₱ ton .... $18.00@20.00
Barytes, Amer. floated ..... 18.50@20.00
Barytes, Crude, No. 1 ..... 9.00@10.00
Chalk, in bulk ..... ₱ ton 3.25@ 3.50
Chalk, in bbls ..... ₱ 100 ℔ ..@ 35
China Clay, English .. ₱ ton 11.00@17.00
Cobalt, Oxide ..... ₱ 100 ℔ 2.00@ 2.65
Whiting, Common. ₱ 100 ℔ .45@ .55
Whiting, Gilders ..... .62@ .68
Whiting, extra Gilders' .... .66@ .72

### Putty.
In bladders ..... 1¾@2¼
In bulk ..... 1½@2
In cans 1 ℔ to 5 ℔ ..... 2½@4¼
In cans 12 ½℔ to 25 ℔ ..... 1½@2¼

### Spirits Turpentine.
In Oil bbls ..... 56 @56¼c
In machine bbls ..... 56½@57 c

### Glue.
Cabinet ..... ₱ ℔ 11½@16
Common Bone ..... 6½@ 8
Extra White ..... 18 @23
Foot Stock, White ..... 11½@13½
Foot Stock, Brown ..... 7½@10
German Bi tles ..... 12½@16
French ..... 13 @40
Irish ..... 13½@16
Low Grade ..... 9 @12
Medium White ..... 14½@16¼

### Animal, Fish and Vegetable Oils.
Linseed, City, raw ..... ₱ gal. .37 @ 38
Linseed, City, boiled ..... 39 @40
Linseed, State and West'n, raw 35 @36
Linseed, raw Calcutta seed ..... 75 @ —
Lard, Prime ..... 64 @65
Lard, Extra No. 1 ..... 52 @54
Lard, No. 2 ..... 43 @44
Cotton-seed, Crude, f.o.b mills. 27½@32
Cotton-seed, Summer Yellow, prime ..... 42 @42½
Cotton-seed Summer Yellow, off grades ..... 38 @38½
Sperm, Crude ..... @ —
Sperm, Natural Spring ..... 65 @67
Sperm, Bleached Spring ..... 67 @68
Sperm, Natural Winter ..... 69 @70
Sperm, Bleached Winter ..... 71 @72
Tallow, Prime ..... 49 @50
Whale, Crude ..... @ —
Whale, Natural Winter ..... 46 @47
Whale Bleached Winter ..... 48 @49
Menhaden, Brown, Strained .. .31 @32
Menhaden, Light Strained ..... 32 @33
Menhaden, Bleached Winter .. .34 @35
Menhaden, Ex Bleached Winter 36 @37
Cocoanut, Ceylon ..... 57@6
Cocoanut, Cochin ..... 6@6¼
Cod, Domestic ..... 37 @38
Cod, Newfoundland ..... 41 @42
Red Elaine ..... 45 @46
Red Saponified ..... ₱ ℔ 4¼@ 4¼
Olive, Italian, bbls ..... 52 @ 57
Neatsfoot, prime ..... 55 @ 56
Palm, prime, Lagos ..... ₱ ℔ 6 @

### Mineral Oils.
Black, 20 gravity, 25@30 cold test ..... ₱ gal. 13 @14
Black, 29 gravity, 15 cold test. 14 @15
Black, Summer ..... 13 @14
Cylinder, light filtered ..... 20½@21½
Cylinder, dark filtered ..... 18½@19½
Paraffine, 903-907 gravity ..... 15 @15½
Paraffine, 903 gravity .. ..... 14 @14½
Paraffine, 883 gravity ..... 11¾@12
Paraffine, red, ..... 14 @15½
In small lots ½¢ advance.

# CURRENT METAL PRICES.

## AUGUST 26, 1903.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

### IRON AND STEEL—

#### Bar Iron from Store—

| | |
|---|---|
| Refined Iron: | |
| 1 to 1¾ in. round and square | ₩ lb .... @2.00¢ |
| 1⅛ to 4 in. x ¾ to 1 in. | ₩ lb .... @2.00¢ |
| 1⅛ to 4 in. x ¼ to 5-16 | ₩ lb .... @2.20¢ |
| Rods—⅜ and 11-16 round and square | ₩ lb .... @2.20¢ |
| Angles: | Cts ₩ lb |
| 3 in. x ¼ in. and larger | 2.30 |
| 3 in. x 3-16 in. and ¼ in. | 2.55¢ |
| 1½ to 2½ in. x ¼ in. | 2.35¢ |
| 1½ to 2¾ in. x 3-16 in. and thicker | 2.30¢ |
| 1 to 1¼ in. x 3-16 in. | 2.35¢ |
| 1 to 1¼ x ⅛ in. | 2.40¢ |
| ⅞ x ¼ in. | 2.55¢ |
| ¾ x ¼ in. | 2.65¢ |
| ⅝ x ¼ in. | 3.45¢ |
| ½ x 3-32 in. | 3.95¢ |
| Tees: | |
| 1 in. | 2.80¢ |
| 1¼ in. | 2.60¢ |
| 1½ in. and larger | 2.50¢ |
| Beams | 2.50@3.00¢ |
| Channels, 3 in. and larger | 2.50@3.00¢ |
| Bands—1½ to 6 x 3-16 to No. 8 | ₩ lb 2.40¢ |
| "Burden's Best" Iron, base price | ₩ lb 2.90¢ |
| Burden's "H. B. & S. Iron, base price | ₩ lb 2.70¢ |
| "Ulster" | ₩ lb 3.15¢ |
| Norway Bars | 3.75@4.25¢ |
| Norway Shapes | 4.00@4.50¢ |

#### Merchant Steel from Store—

| | Per lb |
|---|---|
| Bessemer Machinery | 2.10¢ |
| Toe Calk, Tire and Sleigh Shoe | 2.30@3.00¢ |
| Best Cast Steel, base price in small lots | 7¢ |

#### Soft Steel Sheets—

| | | | |
|---|---|---|---|
| ¼ inch | 2.40¢ | No. 14 | 2.70¢ |
| 3-16 inch | 2.40¢ | No. 16 | 2.80¢ |
| No. 8 | 2.40¢ | No. 18 | 3.00¢ |
| No. 10 | 2.50¢ | No. 20 | 3.00¢ |
| No. 12 | 2.60¢ | No. 22 | 3.10¢ |

#### Sheet Iron from Store.

##### Black.

| | One Pass, C. R. Soft Steel | G. R. Cleaned. |
|---|---|---|
| Nos. 14 to 16 | ₩ lb 2.80 | 3.0 ¢ |
| Nos. 18 to 21 | ₩ lb 2.90 | 3.10¢ |
| Nos. 22 to 24 | ₩ lb 3.00 | 3.20¢ |
| Nos. 25 and 26 | ₩ lb 3.10 | 3.30¢ |
| No. 27 | ₩ lb 3.20 | 3.40¢ |
| No. 28 | ₩ lb 3.30 | 3.50¢ |

#### Russia, Planished, &c.

| | |
|---|---|
| Genuine Russia, according to assortment | ₩ lb 11¾@14¢ |
| Patent Planished | ₩ lb A, 10¢; B, 9¢, net. |

#### Galvanized.

| | |
|---|---|
| Nos. 14 to 16 | ₩ lb, 3.24¢ |
| Nos. 18 to 20 | ₩ lb, 3.51¢ |
| Nos. 22 to 24 | ₩ lb, 3.78¢ |
| No. 26 | ₩ lb, 4.05¢ |
| No. 27 | ₩ lb, 4.32¢ |
| No. 28 | ₩ lb, 4.59¢ |
| No. 30 | ₩ lb, 5.67¢ |

No. 20 and lighter, 36 inches wide, 25¢ higher.

#### Foreign Steel from Store—

| | |
|---|---|
| Best Cast | ₩ lb 15 ¢ |
| Extra Cast | ₩ lb 18 @ 20 ¢ |
| Swaged, Cast | ₩ lb 16 ¢ |
| Best Double Shear | ₩ lb 15 ¢ |
| Blister, 1st quality | ₩ lb 13 ¢ |
| German Steel, Best | ₩ lb 10 ¢ |
| 2d quality | ₩ lb 9 ¢ |
| 3d quality | ₩ lb 8 ¢ |
| Sheet Cast Steel, 1st quality | ₩ lb 15 ¢ |
| 2d quality | ₩ lb 14 ¢ |
| 3d quality | ₩ lb 12 ¢ |
| R. Mushet's "Special" | ₩ lb 46 ¢ |
| " " "Titanic" | ₩ lb 19 ¢ |
| Hobson's Choice XX Extra Best | ₩ lb 35 ¢ |
| Jessop Self Hardening | ₩ lb 45 ¢ |
| Seamans' "Nelson" Steel | 40 ¢ |
| Hobson's "Soho" Special Self-Hardening | ₩ lb 43 ¢ |

### METALS—

#### Tin—

| Duty.—Pigs, Bars and Block. Free. | Per lb |
|---|---|
| Banca, Pigs | 29¼@29¾¢ |
| Straits, Pigs | 29¼@29¾¢ |
| Straits in Bars | 30 @30½¢ |

#### Tin Plates—

##### American Charcoal Plates.

| | |
|---|---|
| Calland Grade: | |
| IC, 14 x 20 | $6.75 |
| IX, 14 x 20 | 8.25 |
| Melyn Grade: | |
| IC, 14 x 20 | 6.50 |
| IX, 14 x 20 | 7.75 |
| Allaway Grade: | |
| IC, 14 x 20 | 5.50 |
| IX, 14 x 20 | 6.60 |

##### American Coke Plates—Bessemer—

| | |
|---|---|
| IC, 14 x 20 ....108 lb | $4.60@4.70 |
| IX, 14 x 20 | $5.90@6.15 |

##### American Terne Plates—

| | |
|---|---|
| IC, 20 x 28 | $9.00 |
| IX, 20 x 28 | $11.00 |

#### Copper—

Duty: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₩ lb.

#### Ingot—

| | |
|---|---|
| Lake | 14@14¼¢ |
| Casting | 13¾@14¢ |

#### Sheet and Bolt—

March 12, 1903. Net.

Prices, in cents per pound. Sheet 30 x 60.

| Not wider than | Not longer than | And longer than | 64 oz. & over, 60 lb. sheet, 30 x 60 and heavier. | 38 oz. to 64 oz. 45 to 90 lb. | 24 oz. to 36 oz. 18¾ to 28 lb. | 16 oz. to 24 oz. 12½ to 18¾ lb. | 14 oz. and 15 oz. 11 to 12½ lb. | 12 oz. and 13 oz. 9½ to 11 lb. | 10 oz. and 11 oz. 7½ to 9½ lb. | 8 oz. and 9 oz. 6¼ to 7¼ lb. | Lighter than 8 oz. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ins. | Ins. | Ins. | | | | | | | | | |
| 30 | 72 | ..... | 20 | 21 | 21 | 21 | 22 | 23 | 24 | 27 | 30 |
| 30 | 96 | 72 | 20 | 21 | 21 | 21 | 22 | 24 | 27 | 30 | |
| 30 | ..... | 96 | 20 | 21 | 21 | 21 | 23 | 27 | | | |
| 36 | 72 | ..... | 20 | 21 | 21 | 21 | 23 | 25 | 28 | 31 | |
| 36 | 96 | 72 | 20 | 21 | 21 | 21 | 23 | 27 | 30 | | |
| 36 | 120 | 96 | 20 | 21 | 21 | 22 | 24 | | | | |
| 36 | ..... | 120 | 20 | 21 | 20 | 23 | | | | | |
| 48 | 72 | ..... | 20 | 21 | 20 | 23 | 25 | 28 | 31 | | |
| 48 | 96 | 72 | 20 | 21 | 20 | 24 | 26 | 29 | | | |
| 48 | 120 | 96 | 20 | 21 | 23 | 25 | 29 | | | | |
| 48 | ..... | 120 | 20 | 22 | 24 | 27 | | | | | |
| 60 | 72 | ..... | 20 | 21 | 22 | 24 | 27 | 32 | | | |
| 60 | 96 | 72 | 20 | 21 | 23 | 25 | 30 | | | | |
| 60 | 120 | 96 | 20 | 22 | 24 | 27 | | | | | |
| 60 | ..... | 120 | 21 | 23 | 25 | 29 | | | | | |
| 72 | 96 | ..... | 20 | 22 | 24 | 29 | | | | | |
| 72 | 120 | 96 | 20 | 23 | 26 | 31 | | | | | |
| 72 | ..... | 120 | 21 | 24 | 29 | | | | | | |
| 108 | 96 | ..... | 21 | 24 | 27 | | | | | | |
| 108 | 120 | 96 | 22 | 25 | 28 | | | | | | |
| 108 | ..... | 120 | 23 | 26 | 30 | | | | | | |
| wider than 108 | 132 | 132 | 24 | 27 | | | | | | | |
| | | | 25 | 28 | | | | | | | |

Rolled Round Copper, ⅜ inch diameter and over, ₩ lb 20¢.

Circles, Segments and Pattern Sheets, 3¢ ₩ lb advance over price of Sheet Copper required to cut them from.

Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.

All Polished Copper, 20 in. wide and under, 1¢ ₩ lb advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 in. wide, 2¢ ₩ lb advance over the price for Cold Rolled Copper.

#### Planished Copper—

1¢ ₩ lb more than Polished Copper.

#### Copper Bottoms, Pits and Flats—

| | |
|---|---|
| 14 oz. to square foot and heavier, ₩ lb | 25¢ |
| 12 oz. and up to 14 oz. to square foot, ₩ lb | 26¢ |
| 10 oz. and up to 12 oz., ₩ lb | 27¢ |
| Lighter than 10 oz., ₩ lb | 28¢ |

Circles less than 8 in. diameter, 2¢ ₩ lb additional

Circles over 13 in. diameter are not classed as Copper Bottoms.

Polished Copper Bottoms and Flats, 1¢ ₩ lb extra.

#### Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.
*List Feb. 20, 1901.*

| Nos. | 0000 to 8 Base | 9 and 10 ¼¢ | 11 and 12 ¼¢ ₩ lb adv. |
|---|---|---|---|
| Nos. | 13 | 14 15 | 16 |
| | ¼¢ | ⅝¢ 1¢ | 1¼¢ ₩ lb adv. |
| Nos. | 17 | 18 19 | 20 |
| | 1¾¢ | 2¢ 2¼¢ | 2¾¢ ₩ lb adv. |

#### Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net.

| Stubs' W.G. | B. & S. W.G. | ⅛ | 5-16 | ¼ | 7-16 | ⅜ | 9-16 | ⅝ | ¾ | ⅞ | 1 | 1¼ | 1½ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-11 | 3- 9 | ... | ..... | ... | ..... | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 12 | 10 | ... | ..... | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 13 | 11 | ... | ..... | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 14 | 12 | ... | 41 | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 15 | 13 | ... | 42 | 38 | 36 | 33 | 32 | 31 | 30 | 30 | 28 | 26 | 25 |
| 16 | 14 | ... | 43 | 39 | 37 | 34 | 33 | 32 | 31 | 30 | 29 | 26 | 25 |
| 17 | 15 | ... | 44 | 4- | 38 | 35 | 34 | 33 | 32 | 31 | 30 | 27 | 26 |
| 18 | 16 | 61 | 46 | 42 | 39 | 36 | 35 | 34 | 33 | 31 | 30 | 28 | 27 |
| 19 | 17 | 62 | 47 | 43 | 40 | 37 | 36 | 35 | 34 | 33 | 32 | 30 | 29 |
| 20 | 18-19 | 64 | 49 | 44 | 41 | 39 | 38 | 37 | 36 | 35 | 34 | 32 | 31 |
| 21 | 20 | 66 | 51 | 46 | 43 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 |
| 22 | 21 | 71 | 56 | 48 | 44 | 42 | 41 | 40 | 39 | 38 | 37 | 37 | 36 |
| 23 | 22 | 76 | 61 | 50 | 46 | 44 | 43 | 42 | 41 | 40 | 39 | 39 | 39 |
| 24 | 23 | 81 | 66 | 53 | 48 | 46 | 45 | 44 | 43 | 41 | 40 | 40 | 41 |
| 25 | 24 | 86 | 71 | 56 | 51 | 49 | 47 | 46 | 45 | 43 | 43 | 44 | 45 |

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional

#### Iron Pipe Sizes—Brass

| ⅛ | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 6 inch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36 | 32 | 29 | 27 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 20 | 23 | 25 | 27 | 28¢ ₩ lb |

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb additional

#### Brazed Brass Tubing.

(*To No. 19, inclusive.*) June 6, 1898.
Brown & Sharpe's gauge standard.

| | | | Per lb. |
|---|---|---|---|
| Plain Round Tube, ¾ in. up to 2 in. | | | $0.35 |
| " | ⅜ | ¾ " | .36 |
| " | ⅜ | ⅞ " | .38 |
| " | ⅜ | 1 " | .41 |
| " | 5-16 | ⅞ " | .48 |
| " | ¼ | 5-16" | .65 |
| " | 3-16 | ¼" | 1.00 |
| " | ⅛ | 3-16" | 1.50 |
| Smaller than ⅛ inch | | | Special |
| 2 inch to 3 inch, to No. 19, inclusive | | | .38 |
| 3 inch | | | .40 |
| Over 3 inch to 3½ inch, inclusive | | | .45 |
| Over 3½ inch | | | .50 |

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list ⅘ 35%

#### Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

| Common High Brass | in. | in. | in. | in. | in. | in. | in. | in. | in. |
|---|---|---|---|---|---|---|---|---|---|
| Wider than | 2 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | |
| and including | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | |
| To No. 20 inclusive | .32 | .33 | .25 | .27 | .29 | .31 | .33 | .36 | |
| Nos. 21 22, 23 and 24 | .22 | .24 | .26 | .28 | .30 | .32 | .34 | .37 | |
| Nos. 25 and 26 | .23 | .24½ | .27 | .29 | .31 | .33 | .35 | .38 | |
| Nos. 27 and 28 | .25 | .25 | .28 | .30 | .32 | .34 | .33 | .39 | |
| Common High Brass | in. | in. | in | in. | in. | in. | in. | in. | in. |
| Wider than | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | |
| and including | 28 | 30 | 32 | 34 | 36 | 38 | 40 | | |
| To No. 20, inclusive | .39 | .42 | .46 | .50 | .55 | .60 | .65 | * | |
| Nos. 21, 22, 23 and 24 | .40 | .43 | .47 | .51 | .56 | .61 | .66 | | |
| Nos. 25 and 26 | .41 | .44 | .48 | .52 | .57 | .63 | .68 | | |
| Nos. 27 and 28 | .42 | .45 | .49 | .53 | .58 | .65 | .70 | | |

* Special prices not less than 80 cents.

Add ½¢ ₩ lb additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List 25%

#### Wire in Coils.

List February 26, 1900.

| Brown & Sharpe's gauge the standard. | Com. high brass. | Low brass. | Gilding bronze and copper |
|---|---|---|---|
| All Nos. to No. 10, inclusive | $0.23 | $0.27 | $0.28 |
| Above No. 10 to No. 16 | .23½ | .27½ | .28½ |
| No. 17 and No. 18 | .24 | .28 | .32 |
| No. 19 and No. 20 | .25 | .29 | .33 |
| No. 21 | .26 | .30 | .34 |
| No. 22 | .27 | .31 | .35 |
| No. 23 | .28 | .32 | .36 |
| No. 24 | .30 | .34 | .38 |
| No. 25 | .32 | .36 | .40 |
| No. 26 | .35 | .39 | .43 |
| No. 27 | .38 | .42 | .46 |
| No. 28 | .42 | .46 | .51 |
| No. 29 | .45 | .49 | .54 |
| No. 30 | .48 | .52 | .62 |
| No. 31 | .51 | .55 | .67 |
| No. 32 | .55 | .59 | .73 |
| No. 33 | .59 | .63 | .82 |
| No. 34 | .64 | .68 | .95 |
| No. 35 | .70 | .74 | 1.30 |
| No. 36 | .76 | .80 | 1.50 |
| No. 37 | 1.00 | 1.04 | 1.70 |
| No. 38 | 1.30 | 1.34 | 2.00 |
| No. 39 | 2.00 | 2.00 | 3.25 |
| No. 40 | 2.60 | 2.60 | 5.75 |

Discount, Brass Wire, 25%; Copper Wire, Net. List November 16, 96.

Spring Wire, 2¢ ₩ lb advance.

#### Tobin Bronze—

| | |
|---|---|
| Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb, net | 19¢ |
| Finished Piston Rods, ⅜ to 2½ in. diameter, ₩ lb net | 20¢ |

Other sizes and extreme lengths, special prices.

#### Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb

| | |
|---|---|
| Western Spelter | 6@6¼¢ |

#### Zinc.

Duty: Sheet, 2¢ ₩ lb.

| | | | |
|---|---|---|---|
| No. 9, base casks | 7½¢ | Open, per lb | 8¢ |

#### Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

| | |
|---|---|
| American Pig | 4.60@4.70¢ |
| Bar | 5@5¼¢ |
| Pipe | 5¼@5½¢ |
| Tin Lined Pipe | 12½¢ 20% off |
| Block Tin Pipe | 37½¢ net |
| Sheet Lead | 6@6¼¢ |

Old Lead in exchange, 3¾¢ ₩ lb

#### Solder.

| | |
|---|---|
| ½ & ⅓ guaranteed | 18½@19 ¢ |
| No. 1 | 16 @17 ¢ |

Prices of Solder indicated by private brand vary according to composition.

#### Antimony—

Duty, ¾¢ ₩ lb.

| | |
|---|---|
| Cookson | ₩ lb 7¾¢ |
| Hallett's | ₩ lb 7 ¢ |
| U. S. | ₩ lb 6¾¢ |

#### Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods, 13¢ ₩ lb.

| | |
|---|---|
| No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting: | |
| Small lots | ₩ lb 37¢ |
| 100-lb lots | ₩ lb 35¢ |
| No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting: | |
| Small lots | ₩ lb 34¢ |
| 100-lb lots | ₩ lb 33¢ |

Aluminum Sheet, B. & S. gauge, 50 lb or more

| Wider than | 8-in. ₩ lb. | 14-in. ₩ lb. | 24-in. ₩ lb. |
|---|---|---|---|
| And including | 14-in. | 24-in. | 30-in. |
| Nos. 13 to 19 | $0.42 | $0.44 | $0.47 |
| No. 20 | .44 | .46 | .49 |
| Nos. 21 to 23 | .46 | .48 | .51 |
| No. 24 | .46 | .50 | .53 |
| No. 25 | .47 | .51 | .54 |
| No. 26 | .47 | .54 | .59 |
| No. 27 | .48 | .57 | .62 |
| No. 28 | .48 | .57 | .61 |
| No. 29 | .49 | .60 | .69 |
| No. 30 | .50 | .64 | .77 |

*Note.*—Lots of less than 50 lb 5¢ ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

| | | | |
|---|---|---|---|
| Larger than No. 9 | ₩ lb 40¢ | No. 15 | ₩ lb 43¢ |
| No. 9 to No. 10 | ₩ lb 40½¢ | No. 17 | ₩ lb 50¢ |
| No. 11 | ₩ lb 41 ¢ | No. 18 | ₩ lb 55¢ |
| No. 12 | ₩ lb 41½¢ | No. 19 | ₩ lb 60¢ |
| No. 13 | ₩ lb 42 ¢ | No. 20 | ₩ lb 65¢ |
| No. 14 | ₩ lb 42½¢ | No. 21 | ₩ lb 85¢ |

#### Old Metals.

*Dealers' Purchasing Prices Paid in New York.*

| | |
|---|---|
| Heavy Copper | ₩ lb 14¢ |
| Light and Tinned Copper | ₩ lb 13½¢ |
| Heavy Brass | ₩ lb 10½¢ |
| Light Brass | ₩ lb 7½¢ |
| Lead | ₩ lb 4½¢ |
| Tea Lead | ₩ lb 4½¢ |
| Zinc | ₩ lb 4 ¢ |
| No. 1 Pewter | ₩ lb 24¢ |
| No. 2 Pewter | ₩ lb 20¢ |
| Pure Aluminum, Sheet, ₩ lb | 21¢ |
| Cast Aluminum, ₩ lb | 16¢ |
| Tin Plate scrap | ₩ ton $4.50 |
| Wrought Scrap Iron | ₩ gross ton $14.00@14.50 |
| Heavy Cast Scrap | ₩ gross ton $13.50@14.00 |
| Stove Plate Scrap | ₩ gross ton $8.00@8.50 |
| Burnt Iron | ₩ gross ton $7.50@8.00 |